

INDEX TO DIVISION SL

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I hereby certify that the Special Provisions for lighting construction (Section SL-1 and SL-2) contained in this proposal were prepared by me or under my direct supervision and that I am a duly licensed Professional Engineer under the laws of the State of Minnesota.



J. E. Budke, PE

Lic. No. 8934

Date 11/28/11

ROADWAY LIGHTING SYSTEM SPECIAL PROVISIONS

DIVISION SL

SL-1 (1802) QUALIFICATION OF WORKERS

The provisions of Mn/DOT Specification 1802 are hereby supplemented with the following:

Signal and Lighting Certification will be required for all Contractors, Supervisors or Foremen involved in the field installation of the Traffic Signal and/or Lighting portion of this Project. Signal and Lighting Certification, Level II, is available through the Mn/DOT Office of Traffic, Safety, and Technology (OTST). Questions regarding certification or past certification may be directed to the Mn/DOT Office of Traffic, Safety, and Technology (OTST) at Telephone No. (651) 234-7055.

Certified Contractor personnel shall be on the Project work site at all times to perform or directly supervise the installation of a Traffic Signal System or a Lighting system.

SL-2 (2545) ELECTRIC LIGHTING SYSTEMS

This work shall consist of furnishing labor, equipment, and materials for construction of an electric lighting system in accordance with the applicable provisions of Mn/DOT 2471, Mn/DOT 2545, current edition of the National Electric Code, the Plans, and the following:

SL-2.1 GENERAL

A. "As Built Plans"

The Contractor shall furnish "as built Plans" that contain any **changes** in the following:

- Cable locations.
- Conduit locations.
- Light pole locations.
- Feedpoint locations.
- Handhole locations.

Any discrepancy or additions between the final plan and how the lighting system was actually built **must be indicated** on the "as built plan".

The "as built Plans" shall be in a form that is satisfactory to the Engineer. The Contractor furnished "as built Plans" shall be considered incidental work.

B. Maintain Street Lighting

Except during any periods of authorized work suspension, the Contractor shall be responsible for all maintenance of the existing lighting, temporary, and newly constructed lighting systems within the limits of the construction project during the duration of the lighting project and in accordance with the applicable provisions of Mn/DOT 1514. This maintenance shall include: lighting units,

ROADWAY LIGHTING SYSTEM SPECIAL PROVISIONS

luminaires, lamps (after 30% or more of the lamps are burned out), lighting service cabinet(s), photoelectric controls, foundations (concrete or steel), cable, and damage and knockdowns (due to Contractor operations) until final written acceptance of the project by the Engineer (Mn/DOT 1716). This work shall be considered incidental work.

Any damage, that in the opinion of the Engineer, has occurred by someone, other than the Contractor's operation, shall be maintained and repaired by the Contractor and will be paid for in accordance with Mn/DOT 1403 (EXTRA WORK).

During any periods of authorized work suspension, the Department will provide and maintain all items of the existing lighting system.

THE CONTRACTOR SHALL FURNISH TO THE DEPARTMENT THE NAMES AND PHONE NUMBERS OF CONTACT PERSONNEL FOR BOTH DAY AND NIGHT OPERATION FOR THE MAINTENANCE OF THE EXISTING LIGHTING SYSTEM.

C. Locating Underground Utilities

The Contractor must adhere to all requirements of Gopher State One Call including the following:

The Contractor is responsible for marking the proposed excavation area by utilizing white markings. The white markings must delineate the **actual excavation area** where the locating of underground facilities is required.

D. System Component and Utility Location Data

1. Mn/DOT approval is required when the cable depth requirement in 2545.3G2 needs to be changed.
2. Collect location coordinates for each lighting unit, lighting cabinets, source of power and underground cable installed using a GPS receiver capable of sub-meter accuracy. Location data shall meet the following criteria:
 - The collected coordinates should be accurate to less than one meter.
 - Use a minimum of 5 satellites by the receiver to collect location data.
 - UTM15N or WGS84 are preferred coordinate systems.

Measure Above ground components from the street side of the asset collected.

Collect underground cable location no more than 2 weeks after it has been installed. Collect underground cable as line geometry. Capture the vertex points every 100 feet and at every junction or change in cable direction. Depth does not need to be collected unless underground cable is installed outside the depth of 2 feet as specified by 2545.3G2. If depth change has occurred, capture a vertex point before and after the depth change.

Data that does not meet the above criteria and guidelines may be rejected and the contractor would

ROADWAY LIGHTING SYSTEM SPECIAL PROVISIONS

be responsible to repeat the data collection.

Provide the system component and utility location data in an electronic, standard geospatial vector data format. Obtain Mn/DOT acceptance of the format prior to commencement of field work.

Completing and submitting the system component and utility location data is considered incidental work.

SL-2.2 MATERIALS

A. Shop Drawings

THE CONTRACTOR SHALL PROVIDE SHOP DETAIL DRAWINGS FOR ALL MATERIALS AND ELECTRICAL EQUIPMENT AS SPECIFIED IN THE CONTRACT DOCUMENT

B. Conduit

The Contractor shall furnish and install either rigid steel conduit (R.S.C.) or non-metallic conduit (N.M.C.) at the locations indicated in the Plans. The size of the conduit shall be as indicated in the Plan. All conduit shall be in accordance with the following:

1. Rigid Steel Conduit (R.S.C.):

Shall be in accordance with Mn/DOT 3801.

2. Non-Metallic Conduit:

Shall be in accordance with Mn/DOT 3803, except as follows:

- a. Shall be NRTL listed as being compliant with UL 651B.
- b. All references to ASTM F 2160 shall be deleted.
- c. Shall be Schedule 80 conduit and fittings for all installations.
- d. For HDPE continuous type conduit, all conduit fittings shall be appropriate for use with HDPE continuous length conduit.
- e. Shall be capable of being installed by plowing, trenching, or directional boring methods.
- f. Shall be either "GREY" or "RED" in color.
- g. Shall be marked on the outside of conduit indicating the following:

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- Manufacturer's name
- Size of conduit
- Type of conduit (HDPE, etc.)
- NRTL Certification Mark
- Any other markings required by the N.E.C.

Before the cables and conductors are installed, non-metallic conduit bell ends (**appropriately sized for the HDPE type conduit**) shall be installed to prevent damage to the cables and conductors

All conduit from concrete foundations to the nearest handhole shall be either rigid steel conduit (R.S.C.) or rigid non-metallic conduit (N.M.C.). **HDPE continuous length conduit is not allowed for use between concrete foundations and the nearest handhole.**

C. Handholes

New Handholes shall be Mn/DOT approved Handholes and Handhole Covers listed on the Mn/DOT Approved/Qualified Products Lists WEB site for Signals:

<http://www.dot.state.mn.us/products/index.html>

D. Luminaire Wire Holder

The Contractor shall furnish and install a wire holder that supports the luminaire cable/conductors within the end of the luminaire slipfitter near the connection point of the luminaire. Mn/DOT approved Wire Holders are listed on the Mn/DOT Approved/Qualified Products Lists WEB site for Lighting:

<http://www.dot.state.mn.us/products/index.html>

E. Extended Life Lamps

The Contractor shall furnish and install Extended Life Lamps in each new luminaire as specified herein and in the Plan. The Contractor shall mark the date of installation on the lamp with a "black oil based paint marker" by striking a line through the month and year and on the porcelain section of the lamp socket base, provide and install all wiring, connections, and miscellaneous hardware required to bypass the existing Igniter in the luminaire in accordance with Manufacturers directions for a complete and operating lamp installation.

Mn/DOT approved Extended Life Lamps are listed on the Mn/DOT Approved/Qualified Products Lists WEB site for Lighting:

<http://www.dot.state.mn.us/products/index.html>

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F. Aboveground Splices

Aboveground splices shall be in accordance with the provisions of Mn/DOT 2545.3G4 and 2565.3J4. When above ground splices are allowed, the Contractor may substitute approved insulated wire splice connector blocks for the specified "split bolt" connector:

Mn/DOT approved Insulated Wire Splice Connector Blocks are listed on the Mn/DOT Approved/Qualified Products Lists WEB site for Lighting:

<http://www.dot.state.mn.us/products/index.html>

The Contractor shall apply two layers of protective vinyl electrical tape over the insulated wire splice connector blocks in the area where the conductors enter the block and extend the wrap at least one (1) inch over the incoming conductor insulation.

G. Above Ground Wiring

Above ground wiring in roadway lighting standards shall be in accordance with Mn/DOT 2545.3G3 and as follows:

The term "14-2 UF" shall be deleted the term "12-2 UF with ground" shall be inserted.

Fuse holders shall be of the breakaway type.

Shall have 6 amp fuses when a 240/480 volt system is installed and 8 amp fuses when a 120/240 volt system is installed.

Mn/DOT approved Fuse Holders are listed on the Mn/DOT Approved/Qualified Products Lists WEB site for Lighting:

<http://www.dot.state.mn.us/products/index.html>

After the conductors have been crimped to the fuse holder the Contractor shall apply two layers of protective vinyl electrical tape over the breakaway fuse holder in the area where the conductors are crimped to the fuse holder. Cover any un-insulated portion of the fuse holder barrel and extend the wrap at least one (1) inch over the incoming conductor insulation.

H. Underground Cable Splice

a. Underground Cable Splice Direct Buried

The Contractor shall furnish and install a direct buried underground cable splice in accordance with the provisions of Mn/DOT 2545.3G4 and as follows:

1. Shall have each individual cable spliced together using a NRTL listed compression-type butt splice barrel connector that is rated for the size of conductor being spliced.

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2. Shall use the manufacturer specific compression tool for crimping the barrel connector to the conductors.
3. Shall cover the entire wire splice with appropriately sized shrink tubing. The shrink tubing shall also cover a minimum of ¼ inch of the conductor insulation on both sides of the splice. After the tubing is slid into position to properly cover the splice it must be heated and shrunk to form a tight seal around the splice and the insulation of the conductor on both sides of the splice.
4. Shall wrap each conductor splice after compression and installation of the shrink tubing with at least two layers of electrical tape to insulate individual conductors prior to encapsulation.
5. Shall have the armor spliced together by drilling a hole in each piece of armor and then bolting the pieces together with brass nuts and bolts and flat washers to form an electrical bond between the two pieces. The bolt head must be facing the cables and the shaft of the bolt must be facing outward.
6. Shall have all splices assembled per the manufacturers installation instructions.
7. Shall place the entire cable splice inside the approved power cable splice encapsulation kit such that when the encapsulating material is poured in the mold it seals up the conductor splices, cable armor and the outer jacket of the armored cable to form one complete assembly. There should be no individual conductor insulation or cable armor exposed when the splice is complete.
See the picture below for an example of a partially assembled splice prior to casting.

Mn/DOT approved Power Cable Splice Encapsulation Kits are listed on the Mn/DOT Approved/Qualified Products Lists WEB site for Lighting:

<http://www.dot.state.mn.us/products/index.html>

8. The power cable splice encapsulation kit shall be assembled per the manufacturer's installation instructions and as follows:
 - a. Wrap electrical insulating tape around the end of each funnel assembly where it meets the cable assemble outer jacket to prevent epoxy from leaking out of the mold prior to curing.

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9. Shall allow the resin to harden and cool after which all conductors of the splice shall be tested and found in compliance with Mn/DOT 2545.3K1

I. Armored Underground Cable

Specification 3815.2C1 is hereby deleted. Armored underground cable shall be in accordance with the following:

1. Shall be listed as meeting the requirements of UL 44 and 1277.
2. Shall meet the requirements of ICEA S-95-658 (NEMA WC 70).
3. Shall have four conductors # 4 AWG.
4. Conductors shall be Class C (19 strand) soft drawn, bare copper wires per ASTM B3 and ASTM B 8.
5. Shall be suitable for use in cable trays, aerial, or direct burial installations
6. Shall be rated for 600 Volts
7. Shall be heat resistant.
8. Shall be moisture resistant.
9. Shall be sunlight resistant.
10. Shall have insulation acceptable for use in wet or dry locations at 90°C.
11. Shall have insulated conductors with chemically cross-linked thermosetting polyethylene (XLPE) insulation.
12. Shall have individual conductors constructed with circuit identification in accordance with method 1 of ICEA S-73-532 (NEMA WC-57) Table E-1 (Black, White, Red and Green) .
13. Shall have a bronze tape armor wrapped around the binder tape and under the outer jacket
The armor shall be a single thickness bronze tape meeting ASTM B 130 with a minimum thickness of 254 μm (0.01 inch) and a spiral overlap of not less than 6.35 mm (0.25 inch).
14. Shall have a polyvinyl chloride (PVC) outer jacket.
15. The jacket shall have a minimum average thickness of 2.03 mm (80 mils) and a minimum thickness at any point of 1.62 mm (64 mils).
16. Shall be constructed using a tape binder
17. Shall have non-hygroscopic fillers used in the interstices of the cable where necessary to give the completed cable assembly a circular cross-section. Fillers made of Jute or Paper are not acceptable .

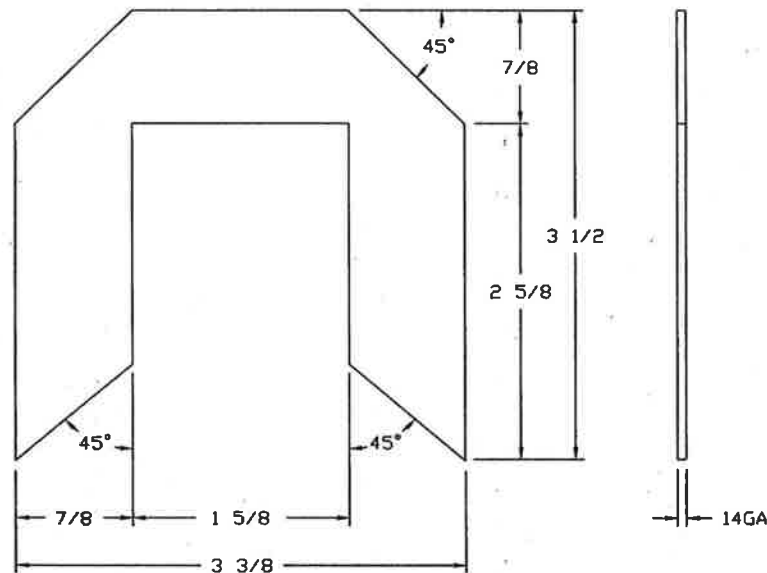
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18. Shall have an outer cable jacket that has a substantially circular cross-section. The outer cable jacket shall not be convoluted and shall not have a ropy appearance.
19. Shall have the outer jacket surface ink printed with the following information:
 - a. Manufacturer Name
 - b. Year of Manufacture (Date Code)
 - c. Type of Cable (i.e. TC SHIELDED, XHHW-2)
 - d. Size and Number of Conductors (i.e. 4/C #4)
 - e. Voltage rating
 - f. Conductor Insulation Rating
 - g. Labeled UL Listed
 - h. Labeled as sunlight resistant (Sun Res) and direct burial (Dir Bur)
 - i. Foot markers

Within 15 days after the Contract approval notice mailing date, the Contractor shall furnish evidence to the Engineer, in writing, that the orders have been placed for all cable required.

J. Leveling Shims

The Contractor shall furnish and install leveling shims when installing aluminum light poles on light bases. The leveling shims shall meet the following requirements:



NOTE:

1. MATERIAL - GALVANIZED STEEL SHEET
36,000 PSI MIN YIELD PER ASTM A924
2. FINISH - PREPLATED GALVANIZED MATERIAL

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K. Grounding Conductors

Bare #6 solid equipment grounding conductors shall be in compliance with Mn/DOT 3815.2B5 except the conductor shall be in compliance with ASTM B 3 soft or annealed copper.

L. Light Base, Design E

The Contractor shall furnish and install a concrete Light Base, Design E in accordance with Mn/DOT 2545.3F and Mn/DOT Standard Plate 8127, at the locations indicated in the Plan.

M. Equipment Pad B

The Contractor shall furnish and install a complete concrete pad in accordance with Mn/DOT Standard Plate No. 8106, at the locations indicated in the Plan. The equipment pad shall be constructed in accordance with Mn/DOT 2545.3F except the concrete shall be Mix No. 3A32.

The equipment pad mentioned will be used for mounting of a lighting service cabinet. The reinforcement bars for use in the foundation shall conform to the requirements of Mn/DOT 3301.

N. Service Cabinet, Secondary Type L1 (240/480 VAC) With Cold Sequence Disconnect

The Contractor shall furnish and install a Service Cabinet, Secondary Type L1 with a Cold Sequence Disconnect before meter socket, for supplying power to an electric lighting system, on an equipment pad concrete foundation at the location indicated in the Plans. Mn/DOT approved Service Cabinet's Secondary Type L1 with Cold Sequence Disconnect are listed on the Mn/DOT Approved/Qualified Products Lists WEB site for Lighting:

<http://www.dot.state.mn.us/products/index.html>

O. Lighting Unit, Type 9-40

The Contractor shall furnish and install a Lighting Unit, Type 9-40. Each Lighting Unit, Type 9-40 shall be in accordance with the applicable provisions of Mn/DOT 2545.2R. The light standard shall be breakaway, fabricated from stainless steel or aluminum, designed for one inch anchor bolts in a four bolt cluster as shown in Mn/DOT Standard Plate No. 8127, shall be in accordance with the details shown in the Plan, shall have a 40 foot nominal luminaire mounting height, and shall have a nine (9) foot davit type mast arm.

Lighting units fabricated from aluminum shall have a 10 inch butt diameter, aluminum wall thickness of 0.188 inches, luminaire tenons of 2 $\frac{7}{8}$ inches, and factory installed vibration damper.

Lighting units fabricated from aluminum shall have a factory installed vibration damper, 10 inch butt diameter, aluminum wall thickness of 0.188 inches, and luminaire tenons of 2 $\frac{7}{8}$ inches.

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Doors in the base of single mast arm units shall be at 180 degrees counterclockwise from the mast arm.

The Cobra Head Luminaires shall be as indicated on the Plan. New Cobra Head Luminaires shall be Mn/DOT approved Cobra Head Luminaires listed on the Mn/DOT Approved/Qualified Products Lists WEB site for Lighting:

<http://www.dot.state.mn.us/products/index.html>

P. Lighting Unit, Type 12-40

The Contractor shall furnish and install a Lighting Unit, Type 12-40. Each lighting unit shall be in accordance with the applicable provisions of Mn/DOT 2545.2R. The light standard shall be breakaway, fabricated from stainless steel or aluminum, designed for one inch anchor bolts in a four bolt cluster as shown in Mn/DOT Standard Plate No. 8127, shall be in accordance with the detail shown in the Plan, shall have a 40 foot nominal luminaire mounting height, and shall have a twelve (12) foot davit type mast arm with a ten (10) foot radius.

Lighting units fabricated from aluminum shall have a 10 inch butt diameter, aluminum wall thickness of 0.188 inches, luminaire tenons of 2 $\frac{7}{8}$ inches, and factory installed vibration dampner.

Doors in the base of single mast arm units shall be at 180 degrees counterclockwise from the mast arm.

The Cobra Head Luminaires shall be as indicated on the Plan. New Cobra Head Luminaires shall be Mn/DOT approved Cobra Head Luminaires listed on the Mn/DOT Approved/Qualified Products Lists WEB site for Lighting:

<http://www.dot.state.mn.us/products/index.html>

SL-2.3 CONSTRUCTION REQUIREMENTS

A. Direct Buried Cable Installation

Plowing direct buried cable shall be done by means of a "vibratory plow with a "feed blade" that breaks the ground, places the cable to a predetermined depth, and closes the break in the ground. The vibratory plow must guide the cable into the bottom of the break, in such a manner, that little or no stress is placed on the cable during installation, ensuring no damage to the cable assembly. The cable must be fed through the plow blade chute and NOT pulled by the plow blade. Installation of underground cable by means of a vibratory plow that "pulls" the cable in place, is not acceptable. The plowing method must be approved by the Engineer before installation of the cable.

B. Labeling of Lighting Cable

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The armored underground cables shall be installed in accordance with Mn/DOT 2545.3G2 and as follows:

All conductors in service cabinets and light pole bases shall be labeled **indicating the next termination point**. For example, **label cable(s)**:

IN THE LIGHTING SERVICE CABINET, label would read:

TO POLE #1

IN POLE #1, labels would read:

TO LIGHTING SERVICE CABINET

TO POLE #2

Labels to identify cables shall consist of white vinyl adhesive tape wrapped around the cable. The labeling shall be hand written on the vinyl adhesive tape or produced with a label maker. If label marking is handwritten, the labeling shall be accomplished by utilizing a black permanent marker, in such a manner, that the markings are legible to the satisfaction of the Engineer. Labels produced with a label maker shall be suitable for use in wet locations, and this label must wrap around the cable one complete revolution with some overlap.

C. Conduit Installation

Conduit shall be installed in accordance with Mn/DOT 2565.3D, except as follows:

Continuous Type HDPE Non-Metallic Conduit:

- except for under existing pavements, underground Continuous Type HDPE Conduit shall be placed by trenching, stitching, plowing, or other method approved by the Engineer. Under existing pavements, Continuous Type HDPE Non-Metallic Conduit shall be placed as specified in 2565.3D2b.

Rigid Non-Metallic Conduit Joints:

- the Contractor shall install appropriate sized long line couplings when installed under existing roadway surfaces
- the applied PVC joint cement shall be allowed to set-up for six (6) hours before pulling the conduit through a directional bored channel.

Conduit in Handholes:

- If the Contract requires the installation of a handhole within an armored cable run, a 2 inch N.M.C. stub out shall be installed for each cable entering the handhole. The 2 inch N.M.C.

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stub out shall be a minimum of 36 inches in length with non-metallic bell ends installed on each open end of the conduit stub out to prevent damage to the armored cable.

D. Handhole Installation

The Contractor shall install handholes in accordance with the provisions of Mn/DOT 2565.3E and as follows:

The required aggregate drain bed below the handhole shall be **compacted** before installation of the handhole.

All handholes shall be backfilled **after** the frame casting and cover have been installed onto the handhole.

E. Light Standard Installation

The Contractor shall install light standards in accordance with Mn/DOT 2545.3H and as follows:

The Contractor shall use only shims for leveling when installing aluminum light standards on light standard bases.

The Contractor shall use only leveling nuts when installing stainless steel light standards on light standard bases.

Where leveling nuts are used, the leveling and top nuts shall both be securely tightened against the light standard base plate. Where shims are used the top nuts shall be securely tightened against the light standard base plate. The leveling nuts and top nuts shall be tightened as follows:

- the threads of the nuts shall be lubricated with a brush on anti seize lubricant and then the nuts shall be torqued to minimum 125 ft-lbs.
required for 1 inch diameter anchorages.
- the threads of the nuts shall be lubricated with a brush on anti seize lubricant and then the nuts shall be torqued to minimum 240 ft-lbs.
required for 1¼ inch diameter anchorages.

F. Light Standard or Light Unit Numbering and Service Cabinet Numbering

The Contractor shall number the light standards or light units (underpass luminaires, tunnel luminaires, special luminaires, etc.) and service cabinets in accordance with Mn/DOT 2545.3P.

Light standards shall be numbered with the complete feed point numbers and letters placed above the pole number regardless if complete numbering is shown in the Plan.

Light Standard Numbering shall consist of the entire feed point designation with the pole number

ROADWAY LIGHTING SYSTEM SPECIAL PROVISIONS

placed below.

The Contractor shall also verify that the light standards and/or light units to be reinstalled are correctly numbered and if not the Contractor shall number the light standards and/or light units in accordance with Mn/DOT 2545.3P.

The outside of the lighting service cabinet shall be labeled in accordance with Mn/DOT 2545.3P and as follows:

In addition to the label on front door of the lighting service cabinet an additional label shall be placed on the side of the cabinet that faces traffic.

Mn/DOT approved Labels are listed on the Mn/DOT Approved/Qualified Products Lists WEB site for Lighting:

<http://www.dot.state.mn.us/products/index.html>

Letters and numbers shall have a minimum stroke width of 0.35 inches.

G. Wiring in Light Standard Concrete Bases

The Contractor shall install conduits in light standard concrete foundations in accordance with the provisions of Mn/DOT 2545.3G. Approximately 2 feet of slack cable shall be left in each light standard base.

H. Service Equipment

The Contractor shall furnish and install service equipment that consists of a meter socket, required mounting brackets, conduit fittings, required wiring, and other items incidental to a complete meter socket installation. The meter socket shall be in accordance with Mn/DOT 3837. Meter will be furnished and installed by others.

The meter socket shall be suitable for single phase 3-wire 240/480 volt AC, shall contain a positive bypass mechanism, shall have lugs that will allow the power conductors to be stripped and laid into the lugs without being cut, and shall be approved by the power company.

I. Electrical Service

The Contractor shall coordinate the installation of Electrical Service, provide power to the service cabinets, and verify the actual work to be done and all associated costs.

Proposed source of power addresses are identified in the Plan.

Fees for the "Application for Electrical Service" and payment to the Utility Company for providing the electrical service connections shall be the responsibility of the Contractor.

The Contractor shall secure approval from the Engineer for any changes to the Electrical Service as

ROADWAY LIGHTING SYSTEM SPECIAL PROVISIONS

reflected in the Plan.

No measurement will be made of the various items that constitute Electrical Service, however all such work will be construed to be included as part of the project (**the electrical service costs will not be paid for as part of the pay item**). The Contractor shall provide the Engineer a copy of the invoice from the power company. Payment will be made for the invoice cost paid to the power company plus 10%. The payment shall be compensation in full for all costs incidental thereto, including, but not limited to providing power to service cabinets, power company fees, Power Utility Company Coordination, notifying Mn/DOT of ownership details, and all materials and labor necessary to construct the Electrical Service.

J. Electric Service Information Form

The contractor shall fill out the following electric service information form for lighting systems.

The Contractor shall provide, to the Engineer prior to final acceptance of the project, four (4) copies of the electric service information form for lighting systems and the copies shall be distributed, by the Engineer, as follows:

1. Mn/DOT Central Electrical Services Unit (Non-Metro Projects Only), or
Mn/DOT Metro Electrical Services Unit (Metro Projects Only).
2. Mn/DOT Traffic Electrical Systems Engineer.
3. Mn/DOT District Traffic Engineer.
4. County of Blue Earth.

The Contractor furnished "electrical service information form for lighting systems" shall be considered incidental work.

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Electric Service Information Form For Lighting Systems

Project Number: _____

Contractor: _____

Date: _____

System	MN/DOT Feed Point Number	Meter Address	Electric Utility Transformer Size In KVA	Length of conductors in feet from transformer connection to meter socket connection.		
				L1 =	L2 =	Neutral =
				L1 =	L2 =	Neutral =
				L1 =	L2 =	Neutral =
				L1 =	L2 =	Neutral =
				L1 =	L2 =	Neutral =
				L1 =	L2 =	Neutral =
				L1 =	L2 =	Neutral =
				L1 =	L2 =	Neutral =
				L1 =	L2 =	Neutral =

ROADWAY LIGHTING SYSTEM SPECIAL PROVISIONS

K. Painting

Painting shall be in accordance with the provisions of Mn/DOT 2545.3M, except that steel lighting service cabinet finish coats, unless specified as otherwise, shall have two field coats of dark green conforming to Mn/DOT 3532.

L. Anti-Seize Lubricant

Threaded portions of all anchor rods above concrete foundations and steel bases shall be coated with a brush-on anti-seize lubricant before installation of lighting units, lighting service cabinets, or other type cabinets on anchor rods.

The Contractor shall also apply brush-on anti-seize lubricant to the access door nut and bolt of each lighting unit.

M. Luminaires & Lamp Labeling

Luminaires and Lamps shall be marked according to 3810.2A. The term permanent marker shall be modified as follows "black oil based paint marker"

N. Luminaire Lamp Igniter Module

During installation of the luminaire the plug in lamp igniter module must be removed from the 3 position socket. The igniter module shall be securely tie wrapped to the inside of the luminaire housing. This work shall be incidental.

O. Bonding and Grounding

All bonding and grounding shall be in accordance with the provisions of Mn/DOT 2545.3R and as follows:

1. All required ground rod electrodes shall be NRTL Listed.
2. The Bronze armor for each cable assembly in each pole base shall be drilled with a 5/16 drill and placed on the grounding stud provided in the pole base.
3. The Re-usable screw type active clamping ground lug with a tang shall be placed on top of the armor.
4. Bonding of the #6 AWG solid bare grounding conductor to the pole base 5/16" grounding stud shall be accomplished by use of a UL listed Re-usable screw type active clamping ground lug with a tang that connects to the 5/16" pole base grounding stud.
5. The entire assembly (bronze armor and the grounding lug) shall be tightened to form an electrically bonded and grounded connection.
6. Shall apply an oxide inhibiting agent to the connection after final connection and

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assembly.

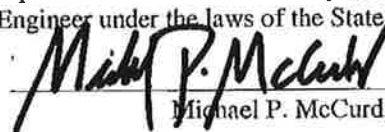
P. Oxide Inhibitor

The Contractor shall apply an oxide inhibiting agent to all No. 6 grounding connections after assembly and final connection.

DIVISION ST

Section		Page
No.	Item	No.
ST-1	(2104) REMOVING MISCELLANEOUS STRUCTURES	1-ST
ST-2	(2564) TRAFFIC SIGNS AND DEVICES	1-ST

I hereby certify that the Special Provisions for traffic sign construction (Division ST) contained in this proposal were prepared by me or under my direct supervision and that I am a duly licensed Professional Engineer under the laws of the State of Minnesota.


 Michael P. McCurdy

Lic. No. 45902

Date 11/28/11

DIVISION ST

ST-1 (2104) REMOVING MISCELLANEOUS STRUCTURES

This work shall consist of removing or salvaging miscellaneous structures in accordance with the provisions of Mn/DOT 2104 and the following:

ST-1.1 CONSTRUCTION REQUIREMENTS

The Contractor shall give 14 calendar days advance notice to Dave DeSutter, General Manager, Minnesota Logos, at 952-895-8079 to have him arrange to remove the Logo signs designated in the Plan as "SALVAGE BY OTHERS".

A Remove Sign Type A

For sign A-201, A-202, A-203, and A-204, the Contractor shall completely remove the concrete footings or H-pile footings.

B Salvage Sign Panel Type A

For sign A-101, the Contractor shall salvage the in place sign panel and remove the post clips.

ST-1.2 METHOD OF MEASUREMENT AND BASIS OF PAYMENT

Payment for Item No. 2104.509 (REMOVE SIGN TYPE __) at the contract price per EACH shall be compensation in full for all work, material and costs involved in performing the work as specified above and in the Plan.

Payment for Item No. 2104.523 (SALVAGE SIGN PANEL TYPE __) at the contract price per EACH shall be compensation in full for all work, material and costs involved in performing the work as specified above and in the Plan.

ST-2 (2564) TRAFFIC SIGNS AND DEVICES

Traffic signs shall be constructed in accordance with the provisions of Mn/DOT 2564, except as modified below:

ST-2.1 MATERIALS

Sign Face and Sign Legend Materials

All signs, markers and delineators, including the numerals on M1-5A Route Markers and M1-5B Type Overlays, shall be fabricated with either Sign Sheeting for Rigid Permanent Signs, Delineators and Markers (Type IX or Type XI), except as specified below:

Sign face material for certain warning signs specified in Mn/DOT 2564.2F3 shall be fluorescent yellow green reflective sheeting.

Sign face material for all other warning signs, yellow markers, yellow delineators, E11-X1 sign panels Type Overlay and the yellow background on Type A and Type OH sign panels shall be fluorescent yellow reflective sheeting, except for the following:

Sign face material for yellow Delineators Type Cylinder Style shall be flexible ASTM Type III MD retroreflective sheeting.

Sign face material for sign panels with brown background shall be white reflective sheeting. Sign legend material for these sign panels shall be brown electronic cuttable (EC) film in accordance with Mn/DOT 2564.2F4. Before applying the brown EC film to the sign face material, the Contractor shall:

Cut and weed out all legend and border (specified on the sign panel detail[s]) in the Plan) from the brown EC film – do NOT cut and weed out the brown EC film that will be covered by Sign Panels Type Overlay (route markers, etc.).

Apply the weeded brown EC film to the sign face material (white reflective sheeting).

Apply the brown EC film “corner” pieces that are located outside the border that fill in the square corners of the sign panel.

Sign face material for the M1-5A Route Marker and the M1-5B Type Overlay shall be as specified in Mn/DOT 2564.2F3.

Sign face material for X4-2 Hazard Markers shall be non-reflectorized black.

Sign face material for white Delineators Type Cylinder Style shall be ASTM Type V or ASTM Type VII MD reflective sheeting.

Sign legend material for colors other than black may be screened in accordance with Mn/DOT 3352.2A5c.

Sign legend material for black legend shall be in accordance with Mn/DOT 3352.2A5c or Mn/DOT 3352.2A5d.

Sign legend material for Hazard Marker X4-2 shall be fluorescent yellow reflective sheeting.

The retroreflective sheeting types and qualified products used for rigid permanent signs, markers and delineators can be found at: <http://www.dot.state.mn.us/products/index.html>.

ST-2.2 CONSTRUCTION REQUIREMENTS

The Contractor shall install Department furnished warning stickers on new Type A, C and D sign panels in accordance with Mn/DOT 2564.3H. The Contractor shall give 30 days advance notice to Ken Wenkel at 507.304.6163 for Mn/DOT signs and XXX at XXX.XXX.XXXX for Blue Earth County signs prior to picking up the Department and County furnished warning stickers.

For Type A signs and sign panel overlays, the Contractor shall affix a fabrication sticker and warning sticker to the backside of each Type A sign panel in the lower right corner (when facing the back of the sign panel) in accordance with Mn/DOT 2564.3H.

The Contractor shall notify Dave DeSutter, General Manager, Minnesota Logos, at 952-895-8079 to have him arrange to install the Logo signs designated in the Plans as “INSTALLED BY OTHERS”.

Replace Paragraphs 6 and 7 of 2564.3E with the following:

The threads of anchor rods and nuts shall be lubricated with an anti-seize material. All leveling nuts and top nuts shall be brought to a snug-tight condition against the post base plate. Nuts shall be determined to be snug-tight when no shifting of top or bottom washers occurs when they are struck with an inspection hammer. After all nuts are snug-tight, the top nuts shall be additionally tightened 1/12th turn (one-half of a flat). Contractor shall mar anchor rod threads at top of top nuts after tightening is complete, per Mn/DOT Specification 2402.3H.

For sign panel overlays on Type A panels detailed in the Plan:

The sign face material shall be Sign Sheeting for Rigid Permanent Signs, Delineators and Markers (Type IX or Type XI), except the sign face material for the yellow background on Type A and Type OH sign panels and E11-X1 sign panels Type Overlay shall be fluorescent yellow reflective sheeting.

The sign legend material shall be Sign Sheeting for Rigid Permanent Signs, Delineators and Markers (Type IX or Type XI), except where black legend is specified the sign legend material shall be in accordance with Mn/DOT 3352.2A5c or 3352.2A5d.

The Contractor shall furnish and install new post clips and torque in accordance with Mn/DOT 2564.3L, Paragraph 2.

The Contractor shall remove inplace sign panel overlays.

The Contractor shall install the salvaged sign panel A-101 on the new bridge mounted support as detailed in the Bridge Plan.

For each Install Sign Panel Type OH in Chart DD of the Plan, the Contractor shall furnish and install new post clips.

For each new Overhead Sign Identification Plate for bridge mounted Type OH signs indicated in the Plan, the Contractor shall install the plate on a 2 lb./ft. post, in accordance with Mn/DOT 2564.3P.

For each new single or set of reference post marker(s), the Contractor shall:

Furnish and install a new 3 lb/ft. flanged channel post at the location to be determined in the field by the Engineer and at the offset detailed in the Plan.

Attach the new marker or set of markers to the sign post with stainless steel bolts, nuts and washers and nylon washers at the mounting height detailed in the Plan. If two markers are mounted back to back, install a nylon washer against the face of each marker to prevent damage to the sheeting materials.

ST-2.3 METHOD OF MEASUREMENT AND BASIS OF PAYMENT

Payment for Item No. 2564.522 (STRUCTURAL STEEL -- __) at the contract price per POUND shall be compensation in full for all work, materials and costs involved in performing the work as specified above and in the Plan.

Payment for Item No. 2564.531 (SIGN PANELS TYPE __) and 2564.535 (SIGN PANEL OVERLAY TYPE __) at the contract price per SQUARE FOOT shall be compensation in full for all work, materials and costs involved in performing the work as specified above and in the Plan.

Payment for Item No. 2564.536 (INSTALL SIGN PANEL TYPE __) at the contract price per EACH shall be compensation in full for all work, materials and costs involved in performing the work as specified above and in the Plan.

Payment for Item No. 2564.550 DELINEATOR TYPE __), Item No. 2564.551 (REFERENCE POST MARKER), Item No. 2564.552 (HAZARD MARKER X4-2), and Item No. 2564.553 (CLEARANCE MARKER X4-4), at the contract price per EACH shall be compensation in full for all work, materials and costs involved in performing the work as specified above and in the plan.

2571 PLANT INSTALLATION AND ESTABLISHMENT

2571.1 DESCRIPTION

This work consists of providing, planting, and establishing trees, shrubs, vines, and perennials of the species, variety, grade, size, or age, and root category specified for the locations shown on the plans, including planting or transplanting plants provided by the Department.

Perform this work in accordance with the current edition of the Inspection and Contract Administration Manual for Mn/DOT Landscape Projects (ICAMMLP).

2571.2 MATERIALS

A Nursery Plant Stock3861

Provide plants of the species shown on the plans in the variety, grade, and size, or age indicated.

A.1 Investigations and Supply of Planting Stock and Materials

By submitting a proposal and accepting award of the contract in accordance with 1205, "Examination of Plans, Specifications, Special Provisions and Site of Work," the Contractor assures familiarity with the project site and contract documents, commitments from suppliers, and delivery of the plant stock and materials required to complete the contract.

A.2 Plant Stock and Materials Documentation

Provide the following plant stock and materials documentation:

- (1) At or before the preconstruction conference, provide the Engineer with a Mn/DOT-preliminary *Certificate of Compliance for Plant Stock, Landscape Materials, and Equipment* (copy of form provided in the current edition of ICAMMLP).
- (2) At least one week before plant stock delivery to the project, provide the Engineer with the following:
 - (2.1) A copy of a valid nursery stock, dealer or grower certificate, registered with the Minnesota Department of Agriculture (MDA), a current nursery certificate or license from a state or provincial Department of Agriculture for each plant stock supplier, or both;
 - (2.2) A copy of the most recent *Certificate of Nursery Inspection* for each plant stock supplier;
 - (2.3) Documentation certifying that plant material shipped from out-of-state nursery vendors subject to state and federal quarantines, is free of currently regulated pests, including Emerald Ash Borers, and Gypsy Moths. To determine if Minnesota vendors are subject to quarantines, call the MDA Supervisor of Nursery Inspection and Export Certification at (651) 201-6388; and
 - (2.4) An updated *Certificate of Compliance*, signed by the Contractor's authorized representative.
- (3) Upon delivery of plant stock and materials to the project, provide the Engineer with the following:
 - (3.1) Bills of lading or shipping documents for plant stock and landscape materials delivered to the project, and
 - (3.2) An updated and signed *Certificate of Compliance*, if necessary, to reflect deviations from the original *Certificate of Compliance* documentation submitted at or before the preconstruction conference.
- (4) As a condition for authorization of payments, provide the Engineer with vendor invoices or billing statements for plant stock and materials used on the project.

The Engineer will consider work performed with plant stock, materials, or equipment that was misrepresented in the documentation, as unauthorized work.

If the Contractor does not provide the documentation required by this section, the Engineer may consider subsequent work unauthorized and the Department may assess a daily charge of \$200.00, on a calendar day basis, until the Contractor achieves compliance.

A.3 Substitutions

The Engineer may allow substitutions in accordance with 1605, "Substitute Materials." Before requesting substitutions, provide written documentation that plants shown on the plans are not available in quantities to fulfill the contract requirements from the individual suppliers on the *Partial List of Nursery Dealers and Growers* in the most current edition of the ICAMMLP. The Engineer, in consultation with the project designer, may authorize specific substitute plants or may extend the contract time to ensure availability of the plants shown on the plans. Provide substitutions equal to or better than the initially specified materials.

B Department Furnished Stock and Transplant Stock

Obtain Department provided stock and transplant stock from sources shown on the plans or specified by the special provisions.

C Incidental Materials and Work

The Department considers incidental materials and work, specified, non-specified, replacement, or miscellaneous, to include materials and work that are incidental to payment for the individual plant installation contract items and for which the Department does not make direct payment.

C.1 Specified Incidental Materials and Work

Supply, install, and maintain incidental materials as required for plant installation and establishment in accordance with the special provisions, plans, and standard planting details.

C.2 Non-specified Incidental Materials and Work

Supply, install, and maintain non-specified incidental materials for plant installation and establishment success in accordance with product labeling, manufacturer's instructions, and applicable laws, regulations and ordinances.

C.3 Replacement Materials and Work

Provide materials and work to replace unacceptable or missing plants, materials, and incidental items in accordance with the special provisions, plans, and standard planting details. Provide replacement materials and work that is equal to or better than the initially specified materials and work.

C.4 Miscellaneous Incidental Materials, Equipment and Work

Miscellaneous incidental materials, equipment, and work include the following:

- (1) Mobilization,
- (2) Traffic control,
- (3) Protection and restoration of vegetation and property,
- (4) Layout and staking,
- (5) Soil cultivation,
- (6) Compost,
- (7) Mulch,
- (8) Rodent protection,

- (9) Staking and guying,
- (10) Seedling shelters,
- (11) Temporary erosion control,
- (12) Mowing,
- (13) Application of herbicides, insecticides, fungicides, and water and
- (14) Other materials, equipment, and work necessary to install, maintain, and establish plants as shown on the plans and in a healthy, vigorous, and weed-free condition.

2571.3 CONSTRUCTION REQUIREMENTS

A General

A.1 Landscape Specialist

Provide a Landscape Specialist, certified by the Department, to perform or supervise plant installation and establishment work. Provide documentation of the Certified Landscape Specialist at or before the preconstruction conference. Landscape specialists may obtain certification by completing the one-day Department Landscape Project Inspection and Administration Training Class and passing a test administered by the Department's Landscape Architecture and Forestry Units. Full certification is valid for 3 years. Landscape Specialists may obtain provisional certification for 1 year by passing a test without completing the training class.

A.2 Notices by Contractor

Notify the Engineer at least 3 calendar days before planned deliveries of initial and replacement planting stock to the project to allow for inspection scheduling. Notify the Engineer at least 24 hours before beginning or changing distinct operations. Include the following in the notice:

- (1) The project number,
- (2) Engineer's name,
- (3) Notification date,
- (4) Intended dates and times for the operations, and
- (5) The planned locations of work.

Provide notifications in writing, using confirmable e-mail, or facsimile transmissions.

A.3 Unauthorized Work and Penalties for Non-compliant Operations

The Engineer will consider work performed as follows to be unauthorized work:

- (1) Without required and acceptable documentation and notifications,
- (2) Without supervision by a certified landscape specialist,
- (3) Without conducting required and acceptable competency tests, or
- (4) In conflict with the working hours of 1803, "Prosecution of Work."

In the case of non-compliant operations, the Department may assess a daily charge of \$200.00, on a calendar day basis, until the Contractor achieves compliance.

A.4 Required Equipment

Provide equipment meeting the requirements of 1805, "Methods and Equipment," and with the following available on the project at all times:

- (1) At least one portable compaction tester capable of measuring compaction in the soil to at least 18 in [450 mm] deep,
 - (2) At least one soil recovery probe for assessment of soil moisture conditions, and
- At least one tree caliper with measurement readings in inches.

B Preconstruction Work

Preconstruction work includes:

- (1) Attending a preconstruction conference,
- (2) Submitting preconstruction documentation,
- (3) Mobilizing equipment and supplies to the project,
- (4) Protecting existing vegetation, resources, and property in accordance with the plans, special provisions, and 1712, "Protection and Restoration of Property," 2031, "Field Office and Laboratory," 2557, "Fencing," and 2572, "Protection and Restoration of Vegetation."

C Staking Planting Holes and Beds

Stake the exact locations and layouts for the Engineer's approval.

To remedy unanticipated, localized problems and seasonal conditions that may hinder plant establishment, the Contractor may request the Engineer's approval to perform the following in accordance with the standard planting details and options shown on the plans:

- (1) Relocate plantings,
- (2) Make plant substitutions, or
- (3) Modify soil or drainage characteristics.

Locate plantings to provide the following:

- (1) A clear sight distance of at least 1,200 ft [360 m] in front of traffic signs and extending 50 ft [15 m] beyond the signs; and
- (2) Clear zones and safety sight corners and lines shown on the plans free of plants.

D Preparing Planting Holes and Planting Beds

To prevent site compaction and damage, do not work in planting holes and bed areas if the soil moisture is greater than field capacity.

D.1 Utilities

Before cultivating soil or excavating holes on the project, meet the requirements of 1507, "Utility Property and Service."

The Contractor may request the Engineer's approval to relocate plantings to avoid unanticipated conflicts with utilities.

D.2 Weed Control and Soil Cultivation

Apply herbicide to actively growing vegetation beginning in spring or fall. Before cultivating individual planting holes and bed areas, kill turf and weed growth within the limits of planting areas that will receive mulch in accordance with the following:

- (1) Mow existing vegetation to at least 3 in [75 mm] at least one week before spraying herbicide. Remove the cuttings. Allow the vegetation to re-grow to a height from 4 in to 8 in [100 mm to 200 mm] before applying the herbicide.
- (2) At least three days before applying herbicide, submit to the Engineer, labels of the intended herbicides and a copy of a valid MN Pesticide Applicator License, including Category A and Category J.

- (3) Spray and kill turf and weeds, including the top growth and roots, only within designated areas using a non-selective, non-residual post emergent herbicide containing 41 percent glyphosate as the active ingredient. Ensure personnel, licensed by the MDA and experienced in the use of chemical pesticides perform the work in accordance with the manufacturer's instructions and recommendations. Apply the herbicide to dry foliage on actively growing vegetation. Apply the herbicide in August or early September before the fall or spring Plant Installation Period (PIP) as required by the contract. If an August or September application is not possible for the spring PIP, apply the herbicide in late April or early May. If precipitation occurs within 6 hours after applying herbicide, reapply herbicide as needed to achieve 100 percent kill.
- (4) Before beginning soil cultivation work, schedule and perform a Competency Test to the satisfaction of the Engineer. The Engineer considers a satisfactory Competency Test one that demonstrates acceptable soil cultivation, incorporation of soil additives, compaction levels, and soil drainage in one planting bed area and one individual tree planting area.
- (5) Before placing soil additives as shown on the plans, use a spading machine to deep cultivate the planting hole and bed areas by loosening the soil to at least 12 in [300 mm] deep and a compaction level of no more than 200 psi [1,400 kPa] to this depth, as measured from the finished grade elevation of the soil. The Engineer may approve other equipment to address site constraints, if requested by the Contractor. For hydraulic spade-type, machine-moved tree-transplanting, the Engineer will not require planting hole cultivation, other than loosening the soil outside the soil-ball perimeter in accordance with the standard planting details shown on the plans.
- (6) Unless otherwise shown on the plans, add 4 in [100 mm] of Grade 2 compost, in accordance with 3890, "Compost" and other soil additives shown on the plans or as requested by the Contractor and approved by the Engineer, over the cultivated planting hole and bed areas and use a spading machine to incorporate it to a depth of at least 12 in [300 mm], as measured from the finished grade elevation of the soil.
- (7) Use a compaction tester to ensure compaction in the planting hole and bed areas does not exceed 200 psi [1,400 kPa] to a depth of at least 16 in [400 mm]. If Contractor-operations result in zones of hardpan or excessively compacted soil, repeat deep cultivation or de-compact the subsoil in accordance with 2105.3.G.2, "Compaction Testing and the Grading and Base Manual" specifically the requirements for turf establishment areas, at no additional cost to the Department.
- (8) Ensure drainage in the planting hole and bed areas. For suspected drainage problems, perform a percolation test by filling a 16 in [400 mm] deep planting hole with water and measuring the time it takes the water to drain from the hole. The Engineer considers adequate drainage equal to or greater than a percolation rate of ½ in/h [12 mm/h]. If drainage does not meet these requirements, request approval from the Engineer to relocate or delete affected planting locations or proceed with Extra Work using one or a combination of the planting details for poorly drained soils, as shown on the plans.
- (9) Apply temporary erosion control measures in accordance with the NPDES permit, SWPPP notes, and 2573, "Storm Water Management." The Contractor may use Type 6 wood chip mulch at a depth no more than 1 in [25 mm] for temporary erosion control in prepared planting bed areas.

D.3 Wet Soils, Rock, and Debris

If the Contractor encounters excessively wet soils, bedrock, or excessive quantities of boulders and construction debris, the Contractor may request the Engineer's approval to relocate or delete plantings, or modify soil or drainage characteristics in accordance with the alternative options in the standard planting details shown on the plans.

E Delivery and Storage of Plants

Before installation, the Engineer will provide for inspection and acceptance of plant stock delivered to the project in accordance with the current edition of the ICAMMLP and 3861, "Plant Stock."

Install plant stock on the day of delivery to the project unless using temporary storage methods. Before installation, keep the roots of plants completely covered with a moisture-holding material consisting of wood chips, straw, sawdust, moss, or soil. Keep the moisture-holding material continuously moist and protect it from drying

winds, direct sunlight, excessive heat, freezing, low humidity, inadequate ventilation, and animal or human harm. The Engineer will consider plants with damage that occurred or was discovered during temporary storage, unacceptable. Do not store plants from one planting season to the next.

E.1 Pruning — Top Growth and Roots

Immediately before planting, prune the roots of bare-root plants, except seedlings, and the top growth of deciduous plants. Cut-back broken or badly bruised roots and dry root tips to sound, healthy tissue. Prune to remove dead, rubbing, damaged, diseased, and suckering branches, and to improve plant symmetry, structure, and vigor. Prune coniferous trees and shrubs only to remove damaged growth or a competing leader.

Prune in accordance with the horticultural practices specified in the current edition of the ICAMMLP and the standard planting details on the plans.

Do not prune oak trees during the oak wilt season from April through July, to prevent the spread of oak wilt disease. Immediately treat accidental cuts or wounds to oaks with a wound dressing in accordance with the standard planting details shown on the plans. Keep wound-dressing material on the project during the oak wilt season.

E.2 Buried Root Flares

The Engineer will consider container-grown and balled and burlapped plant stock unacceptable if provided with more than 4 in [100 mm] of soil depth above the root flare. The Engineer may accept plants provided with no more than 4 in [100 mm] excess soil above the root flare if the excess soil can be removed without damaging the root system of the plants.

E.3 Excessive Roots

Reject containerized or balled and burlapped plants with roots extending at least 4 in [100 mm] beyond the container or burlap.

F Installation of Plants

F1 General

Before proceeding with plant installation work, schedule and perform a competency test demonstrating acceptable plant installation methods to the Engineer's satisfaction and in accordance with the plans and standard planting details, for each plant pay item and root category on the project. The Engineer considers a satisfactory competency test to be one that demonstrates acceptable handling of plants, digging of holes and beds, and installation of plants, initial watering, installation of protection materials and mulching.

Before digging planting holes, rake temporary erosion control wood chip mulch off prepared planting areas to prevent wood chip contamination of the planting soil in the holes.

The Contractor may re-spread wood chip mulch formerly used as temporary erosion control around plants to a depth no greater than 1 in [25 mm] following plant installation, if newly provided and acceptable Type 6 mulch is applied over the top to the depth shown on the standard planting details in the plans.

Dig planting holes to the configuration and minimum dimensions shown in the standard planting details on the plans. If the soil moisture is greater than field capacity, do not work in planting holes and beds.

Ensure drainage in the planting hole and bed areas. For a suspected drainage problem, perform a percolation test by filling a 16 in [400 mm] deep planting hole with water and measuring the time it takes the water to drain from the hole. The Engineer considers adequate drainage equal to or greater than a percolation rate of ½ in/h [12 mm/h]. If drainage does not meet these requirements, request approval from the Engineer to relocate or delete affected planting locations or proceed with extra work using one or a combination of the planting details for poorly drained soils as shown on the plans.

F.2 Individual Plant Stock Types and Installation Requirements

Install plants in accordance with the steps and requirements in the standard planting details shown on the plans and specific to each plant stock type.

G Watering

During the PIP, provide watering equipment and forces on the project capable of completely watering plants as often as necessary to maintain soil moisture in the root zones.

Within 2 hours of installation, saturate the backfill soil of each plant with water. After settling, provide additional backfill to fill in the voids.

H Mulch

Before placing mulch, fine grade and level the planting bed soils with hand tools. Place mulch material in accordance with the standard planting detail shown on the plans no more than seven days after plant installation. The Engineer will consider placement of mulch, contaminated with soil or other materials and not complying with the requirements of 3882, "Mulch Materials," unacceptable. Remove unacceptable mulch from the project.

I Protection of Installed Trees

Use protective materials to ensure the healthy growth and survival of installed trees.

I.1 Staking and Guying

Unless staking and guying is shown on the plans, only stake and guy trees if necessary to maintain the trees in a plumb condition. The following circumstances may warrant staking and guying:

- (1) Excessive soil moisture,
- (2) Light-textured soil,
- (3) Steep slopes,
- (4) Exposure to excessive wind, and
- (5) The likelihood of vandalism.

Install staking and guying in accordance with the standard planting details shown on the plans.

Remove staking and guying within 1 year of initial installation.

I.2 Rodent Protection

Place rodent protection around deciduous, pine, and larch trees in accordance with the standard planting details shown on the plans.

I.3 Tree Painting

Paint trees in accordance with the standard planting details shown on the plans.

I.4 Seedling Tree Shelters

Install seedling tree shelters in accordance with the standard planting details shown on the plans.

J Cleanup and Restoration Work

Perform the following cleanup and restoration work on an ongoing basis and as the final step of the initial planting operations:

- (1) Remove excess materials, rocks and debris from the project;
- (2) Repair turf in disturbed areas with seed mixes as shown on the plans or to match in-place turf;
 - (2.1) Immediately before sowing seed or laying sod, prepare soil as specified in 2575.3.B, "Grading Preparations Prior to Seeding;"
 - (2.2) Uniformly broadcast a Type 4 natural base fertilizer, as specified by 3881.2.B.4, "Type 4 — Natural Based Fertilizer," that provides nitrogen at an application rate of 43 lb/acre;
 - (2.3) Lay sod, or uniformly broadcast seed at 1.5 times the rate specified in Table 2575-1, "Seed Mixture Application Rates." Provide seed in accordance with the requirements of 3876, "Seed" and perform seeding in accordance with Table 2575-2, "Season of Planting;"
 - (2.4) Rake and firm seeded areas to ensure seed contact with the soil;
 - (2.5) Broadcast or disc anchor Type 1 mulch in all seeded areas;
- (3) Install erosion control measures to prevent erosion.

K Plant Establishment Period

K.1 Establishment Period

A Plant Establishment Period (PEP) of at least 2 calendar years begins on the date that initial planting operations on the project are completed and continues until final acceptance of the project, unless otherwise shown on the plans.

K.2 Establishment Work

Keep plants in a healthy growing condition in accordance with the current edition of the ICAMMLP throughout the establishment period and submit Mn/DOT *Landscape Contractor Scouting Reports* in accordance with item 1 of 2571.3.K.2.a, "All Plants." Perform plant establishment work throughout the growing seasons from April through October and as necessary during the dormant seasons from November through March. The Engineer may perform random inspections throughout the PEP to verify compliance. The Engineer will consider the Contractor non-compliant if the Contractor does not maintain plants throughout the PEP and does not submit scouting reports.

The Department may assess a daily charge of \$200.00 for non-compliance, on a calendar day basis, until the Contractor achieves compliance.

K.2.a All Plants

In plant establishment work, perform the following:

- (1) Scout to assess the condition of the plants and the planting site and factors that may influence plant health, vigor, and establishment success. Scout these conditions at least every two weeks during the growing season and at least every month during the dormant season;
- (2) Submit a written scouting report to the Engineer via e-mail by the 1st and 15th of each month during the growing season from April to October and by the 1st of each month during the dormant season from November to March. The Engineer will use the report-frequency and content to assess plant establishment compliance. The report may include scanned copies of the plan sheets with the Contractor notes, copies of the report form found in the current edition of the ICAMMLP, or both. Include the following in the report:
 - (2.1) The project number;
 - (2.2) Engineer's name;
 - (2.3) Name of Contractor's responsible scout or representative;

- (2.4) Dates work was performed;
- (2.5) Work locations;
- (2.6) Work completed;
- (2.7) Prevailing weather conditions;
- (2.8) Soil moisture assessments;
- (2.9) Insect, animal, vehicular, weather, or other damage;
- (2.10) Disease problems;
- (2.11) Treatment recommendations' and
- (2.12) Assessment of overall plant conditions including weed competition and control.
- (3) Maintain soil moisture in accordance with 2571.3.G, "Watering" and the watering guidelines of the standard planting details shown on the plans;
- (4) Repair, adjust, or replace staking and guying, mulch material, planting soil, rodent protection, seedling tree shelters, tree paint, and other incidental items in accordance with the plans;
- (5) Maintain healthy, vigorous plants. free of harmful insects, fungus, and disease;
- (6) Remove dead, dying, and unsightly plants. Provide and install replacement plants in accordance with 2571.2.K.2.b, "Replacement Requirements;"
- (7) Maintain plants in a plumb condition at the planting depth shown on the planting details in the plans;
- (8) Maintain planting areas in a weed-free condition as follows:
 - (8.1) Remove weeds, top growth and roots, within the mulch limits by hand pulling. Pre-water mulched areas to ensure weed top growth and roots are entirely removed. Ensure weeding operations do not contaminate the mulch or project with weed seed, weed-laden soil or propagating weed parts. Remove State and County-regulated noxious weeds to at least 3 ft [900 mm] beyond the mulch limits. Remove weed parts or weed-laden material from the project to avoid the spread of weed infestations;
 - (8.2) Do not spray chemicals for weed control in mulched planting areas during the PEP. The Contractor may apply a non-selective, non-residual post-emergent herbicide containing 41 percent glyphosate, as the active ingredient with a surfactant on a spot treatment basis with a brush or wick applicator. The Contractor may also apply a broad-spectrum dichlobenil based granular, pre-emergent herbicide in accordance with product labeling and manufacturer's recommendations;
 - (8.3) Do not weed whip or weed clip as weed control;
 - (8.4) Mow turf bands around the mulch limits at least 3 ft [900 mm] beyond the limits and at least 4 in [100 mm] high if the turf height exceeds 9 in [230 mm] adjacent to mulched planting areas;
 - (8.5) Mow turf areas installed as part of the project when the growth exceeds 18 in [500 mm] high. Mow turf from 6 in [150 mm] to 12 in [300 mm] high. Control State and County-listed noxious weeds;
- (9) Prune to remove dead, rubbing, damaged or diseased branches, unwanted suckers, and to improve plant form and structure;
- (10) Prevent or repair rutting and other damage that may lead to soil erosion and weed infestation;
- (11) Perform plant establishment operations consistent with plant care and horticultural practices detailed in the current edition of the ICAMMLP; and
- (12) Remove excess material, obsolete temporary erosion control devices, rocks, and debris from the project.

K.2.b Replacement Requirements

Within the first year of the 2-year PEP, determine which plants need replacing. Replace dead, defective, or missing plants and incidental materials in accordance with initial installation requirements, including plants lost due to accidents, vandalism, theft, rodent damage, damage caused by the Contractor, or if ordered by the Engineer, at no additional cost to the Department. Conduct plant replacement operations during the month of May within the first year of the PEP. At least one week before plant replacement, submit a summary report of proposed plant replacements to the Engineer. Include by attachment, copies of plan sheets with the proposed replacement quantities and locations identified and a Mn/DOT *Certificate of Compliance for Plant Stock, Landscape Material, and Equipment*, in the report. Using brightly colored paint, mark on site plants requiring replacement.

Provide replacement plants and incidental materials that are equal to or better than the initial material required by the contract.

If less than a full year remains in the PEP, do not replace plants unless the PEP is extended by a supplemental agreement or change order to provide at least one full year of establishment care.

L Acceptance of Work

For acceptance at full payment, ensure each plant meets the *Criteria For Accepting Plant Size* shown in the current edition of the ICAMMLP.

L.1 Acceptance of Preconstruction Work

The Engineer will accept the preconstruction work after the Contractor secures commitments for required materials, submits a Mn/DOT *Certificate of Compliance for Plant Stock, Landscape Materials, and Equipment*, participates in a preconstruction conference, obtains the Engineer's approval for the progress schedule, moves equipment and supplies to the project, and provides protection for existing plants.

L.2 Acceptance of Preparation of Planting Holes and Beds

For the Engineer's acceptance of preparation of planting holes and beds, complete a competency test, other specified staking, initial weed control, soil cultivation including incorporation of additives, and temporary erosion control work.

L.3 Acceptance of Initial Planting Operation

The Engineer will provisionally accept initial planting operations based on the following:

- (1) Plant stock acceptance,
- (2) Completion of a competency test,
- (3) Installation of individual plants, and
- (4) All incidental material and work items shown in the initial planting operations chapter of the current edition of the ICAMMLP, including initial but not limited to watering, tree protection materials, mulching, proper drainage, pruning, staking and guying, tree painting, fertilizing, erosion control, seeding and clean up.

L.4 Final Acceptance

As a condition for terminating the PEP and conducting the final inspection, the Engineer may require the Contractor to bring the plant establishment work into compliance.

On or about the date of termination of the PEP, the Engineer will perform a final inspection of the project.

The Engineer will determine which plants to accept for payment at the contract unit price, at a reduced payment, or with no payment.

Upon final acceptance, the Engineer will not require further Contractor-care of plantings.

The Engineer will make final acceptance at the completion of the two-year PEP and based on a final inspection of the completed project.

2571.4 METHOD OF MEASUREMENT

The Engineer will measure plants separately by the number of acceptable plants for each contract item in accordance with 2571.5.G, "Payment Schedule."

2571.5 BASIS OF PAYMENT

The Department will make payment for plant installation and establishment at a percentage of the contract unit price per item unit of measure for all costs relating to furnishing, installing, and maintaining, the required plants and associated incidental materials as specified and shown on the plans.

The Engineer may require additional materials and work beyond that specified or shown in the contract. The Department will make payment for the additional materials and work as extra work.

The Department may make full payment, reduced payment or no payment of no more than the maximum eligible partial payment percentage at any payment phase (initial, interim, final) based on the performance of the Contractor (see Payment Checklist in the current edition of the ICAMMLP).

A Full Payment

The Department will make full payment of 100 percent of the contract unit price for each plant the Engineer considers acceptable, upon inspection, if the Contractor fully achieves all Payment Criteria as defined in the Payment Checklist in the current edition of the ICAMMLP.

B Reduced or No Payments

The Department will make a reduced payment or no payment of the contract unit prices for each plant if the Contractor does not achieve all Payment Criteria, as defined in the Payment Checklist in the current edition of the ICAMMLP.

C Initial Payment

The Department will make partial payment up to 70 percent of the contract unit price for each plant for completion of the following work:

C.1 Preconstruction Work

The Department will pay no more than 10 percent of the contract unit price for each plant with the completion and acceptance of preconstruction work as defined in the *Preconstruction Work Checklist* in the current edition of the ICAMMLP.

C.2 Preparation of Planting Holes and Beds

The Department will pay no more than 15 percent of the contract unit price for each plant with the completion and acceptance of preparation of planting holes and beds work as defined in the *Preparation of Planting Holes and Beds Checklist* in the current edition of the ICAMMLP.

C.3 Initial Planting Operations

The Department will pay no more than 45 percent of the contract unit price for each plant with the completion and acceptance of initial planting operations work as defined in the *Initial Planting Operations Checklist* in the current edition of the ICAMMLP.

D Interim Payment

At the end of the first calendar year of the PEP, and after completion and acceptance of the Contractor's work and continuous compliance with the plant establishment requirements as defined by the *Plant Establishment-Year One Checklist* in the current edition of the ICAMMLP, the Engineer may authorize no more than 15 percent of the contract unit price for each plant.

E Final Payment

The Department will make final payment after final inspection and acceptance of the completed project at the end of the PEP. The Engineer may authorize no more than 15 percent of the contract unit price for each plant as defined by the *Plant Establishment Year 2 Checklist* in the current edition of the ICAMMLP. The total final payment includes the Plant Establishment Year 2 payment, assessments and reduced payments, if any, and bonus payment, if eligible.

The Department will not pay for replacement plants, unless authorized by the Engineer.

The Department may continue to withhold any percentage of initial and interim payments from the final payment.

The Department will not reimburse any assessments charged during the contract period at the final payment. If the final voucher shows that the total of initial and interim payments made exceeds the total amount due the Contractor, promptly refund the Department for the overpayment.

F Bonus Payment

When 90 percent or more of all plants installed within the initial plant installation period (PIP) and related contract operations have been continuously acceptable throughout the contract period, the Department will make a bonus payment of 10 percent of the total final contract unit price for plant installation and establishment.

The Department considers replacement plants, replaced during the initial PIP, to be initially installed plants. Replacement plants made during the PEP are not eligible for bonuses.

G Payment Schedule

The Department will pay for plant installation and establishment on the basis of the following schedule:

Item No.	Item	Unit
2571.501	Coniferous tree (size & root category)	tree
2571.502	Deciduous tree (size & root category)	tree
2571.503	Ornamental tree (size & root category)	tree
2571.504	Coniferous shrub (size & root category)	shrub
2571.505	Deciduous shrub (size & root category)	shrub
2571.506	Vine (age or size & root category)	vine
2571.507	Perennial (age or size & root category)	plant
2571.541	Transplant tree (spade size*)	tree
2571.544	Transplant shrub	shrub
2571.546	Transplant vine	vine
2571.547	Transplant perennial	plant

NOTE: State Root Category: Seedling, Bare Root, Machine Moved, Container Grown, Balled and Burlapped

* Spade size: 42 in [1.1 m], 60 in [1.5 m], 78 in [1.9 m], 85 in [2.1 m], 90 in [2.3 m].

SECTION 32 93 12

PLANT INSTALLATION

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes:
1. Protecting existing trees and shrubs.
 2. Furnishing and planting shrubs and perennials.
- B. Method of Measurement:
1. No measurement will be made for protecting existing trees and shrubs.
 2. Furnishing and Planting Shrubs and Perennials:
 - a. Measure as a unit for each species acceptably planted.
- C. Basis of Payment:
1. Protecting existing trees and shrubs, including all necessary materials and labor, shall be incidental.
 2. Payment for acceptable quantities of furnished and planted shrubs and perennials includes:
 - a. Furnishing and planting the materials as specified.
 - b. Furnishing and installing planting soil, mulch, material, protective materials and other specified materials.
 - c. Plant maintenance and replacement until acceptable.
 - d. Disposal of all excess excavated material.
 - e. Restoration in kind of all areas disturbed by Contractor's operations.
 3. Payment for acceptable quantities of furnishing and planting shrubs and perennials shall be at the contract unit price as listed on the Bid Form. All associated work items not otherwise compensated shall be considered incidental.
 4. All costs of plant establishment work shall be at the Contractor's expense, including the costs of any replacement materials required.

5. Payment for acceptable quantities or furnishing and planting shrubs and perennials will be based on the following schedule:

Item	Unit
Deciduous Shrub size and root category	Shrub
Perennial age or size and root category	Plant
Note: State Root Category: - Container Grown	

1.02 REFERENCES

- A. Mn/DOT:
1. 2571 - Plant Installation
 2. 3877 - Select Topsoil Borrow
 3. 3880 - Peat Moss
 4. 3881 - Fertilizer
 5. 3882 - Mulch, Type 6
 6. 3890 - Compost

PART 2 MATERIALS

2.01 MATERIALS

- A. Plant Stock: Mn/DOT 3861
1. See schedule on Drawings for common and botanical names and size
- B. Growing Medium Materials:
1. Select Topsoil Borrow: Mn/DOT 3877
 2. Peat Moss: Mn/DOT 3880
 3. Fertilizer: Mn/DOT 3881
 4. Mulch, Type 6: Mn/DOT 3882
 5. Water: Shall be suitable for human consumption.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Notify Engineer 24 to 48 hours prior to delivery of plant materials to arrange for inspection.

3.02 INSTALLATION

A. General:

1. Install and maintain plants only with an experienced crew under direct supervision of a qualified nurseryman or landscape specialist.
2. Plant only under favorable weather and soil conditions as approved by Engineer.

B. Protecting Existing Trees and Shrubs:

1. Take all necessary measures, including temporary fencing, and minimize construction activity around existing trees and shrubs to ensure survival.
2. Cut existing roots only with sharp, clean, and appropriate cutting tools.
3. Prune back all existing growth in proportion to amount of roots removed. Pruning shall be accomplished under direct supervision of a qualified nurseryman or landscape specialist and as detailed in the Drawings.
4. Dress all wounds immediately and as detailed in the Drawings.
5. Fence all trees outside the drip line.

C. Delivery and Storage of Plants:

1. Install plants on day of delivery to Site.
2. Cover all plant roots until planting with a moisture holding material such as straw, sawdust, moss or soil.

D. New plantings shall be containerized Preparing Plant Holes:

1. Till or brake up soil to 10 inches to 12 inches in a circle 3 to 5 times the root ball diameter, centered over the staked locations.
2. Dig a hole 1-foot larger in diameter than the root ball and the exact depth of root ball in the center of the prepared area.
3. Maintain undisturbed soil in hole beneath the root ball.

E. Plant Installation:

1. Do not drop plant material.
2. Lift only from the bottom of pot or ball, never with the trunk, using dollies and front end loaders as necessary.
- 3.
4. Containerized Trees and Shrubs:
 - a. If root bound, remove from pot by carefully rolling and pressing on the

pot which has been placed on its side.

- b. If the root ball is loose, not root bound, cut off the bottom of the container, place plant in prepared hole, and make a vertical slice in the container and peel off.
 - c. For root bound plant with roots having circled the bottom of the pot, make 4 vertical slices in the root ball.
5. Center plant in the hole, adjust for straightness and that the root collar will be just above the top of the soil.
 6. Backfill with soil dug from the hole, steadying bare root plants from tipping, and lightly packing and watering two or three times according to the size of the hole.
 7. Backfill to the height of the root ball, ensuring that the root collar is exposed.
 8. Do not pack soil on top of the root ball.
 9. Place 3 inches of organic mulch over the planting circle and 4 inches.

F. Topgrowth and Pruning:

1. Prune only broken or dead branches and bare roots.

G. Disposal of Excavated Materials: Disposal of all excess excavated materials is the responsibility of the Contractor.

H. Cleanup and Restoration:

1. Collect and dispose of all excess materials, packaging and containers.
2. Restore or replace in kind all turf or other facilities damaged by Contractor's operations.

I. Plant Establishment Period:

1. Maintain the work and care for plants installed as necessary all plantings for the plant establishment period which shall be one calendar year from date of final job acceptance.
2. Maintenance includes:
 - a. Keeping all plants in healthy growing condition.
 - b. Maintaining adequate, but not excessive, soil moisture at all times.
 - c. Repairing or replacing as necessary, mulch material and planting soil.

- d. Manually removing all weed growth in and 3 feet around all mulched areas.
- e. Applying insecticide spray as necessary.
- f. Furnishing and installing replacement plants as needed, including new mulch and planting soil.
- g. Keeping all plants upright.
- h. Contractor will be held responsible for all plants lost due to acts of vandalism, theft and rodent damage.

J. Acceptance of Work:

- 1. Engineer will Inspect Project:
 - a. Upon delivery of plant materials.
 - b. At the end of the plant establishment period.
 - c. Engineer will notify Contractor of any defective materials or work.
- 2. Contractor will replace all defective work immediately on or at the beginning of the next planting season if directed by Engineer.
- 3. Only plants with one full growing season (June 1 to October 1) of care will be subject to acceptance.
- 4. No payment will be made for unacceptable plantings.

END OF SECTION

STIPULATION FOR FOREIGN IRON OR STEEL MATERIALS

The attached form is for use when the Contractor plans on using and/or supplying ANY foreign iron or steel materials on a Federal Aid Project. The Contractor is directed to the Proposal to determine if this Stipulation is required for a specific project.

S.P. _____

STIPULATION FOR FOREIGN IRON OR STEEL MATERIALS

In accordance with 1601 of these Special Provisions, the Contractor must submit a bid based on supplying material(s) that have been melted and manufactured in the United States, except where the cost of the iron and steel products incorporated in the work does not exceed one tenth of one percent of the total project cost, or \$2,500.00, whichever is greater. The Contractor **must** submit a stipulation for supplying ANY foreign iron or steel materials in accordance with the U.S. Code of Regulations 23CFR635.410 and the requirements of 1601.

The line entry must show the pay item number, a description of the foreign steel product, the estimated quantity, and the estimated invoice price.

PAY ITEM NO.	DESCRIPTION OF FOREIGN STEEL OR IRON PRODUCT OR COMPONENT	ESTIMATED QUANTITIES	ESTIMATED INVOICE PRICE

Total Estimated Invoice Price = _____

Percent of Total Bid Price = _____

Contractor Name: _____

Vendor Number: _____

If Applicable: This form must be submitted to the Department by the Contractor before the bid opening, as indicated in the Special Provisions.

Temporary Raised Pavement Markers (TRPMs)

TRPMs may be used to simulate solid lines without the use of any other pavement marking material and may be used to supplement other types of pavement markings.

TRPMs shall not be used as an interim pavement marking between October 1 and May 1 because of snowplowing operations.

Simulating a Solid Line and a Broken Line

When TRPMs are used to **simulate** a line the following guideline applies, unless otherwise indicated in the Plan or directed by the Engineer:

- Broken Line - place two (2) TRPMs per 2-meter-skip stripe, 2 m on center, and eight (8) meter gap (**use four (4) TRPMs per 10-foot skip strip, 3-1/3 feet on center and 40 foot gap**). The same spacing shall be used whether the marking is for an interim or long-term situation.
- Solid Line - place TRPMs, 3 m (**10 foot**) on center for tangent sections; place TRPMs, 1.5 m (**5 foot**) on center for curve sections over six (6) degrees (291-m radius), steep grades, and concrete pavements.
- Double Solid Line - place two (2) TRPMs separated by 100 mm (**4 inches**) side-by-side using the same spacing required for Solid Lines.

Refer to the details on Page 2 of 2.

Supplementing a Solid Line and a Broken Line

In the following situations, TRPMs do not provide adequate simulation of solid lines and shall only be used to Supplement Solid Lines:

- Areas where the markers, even 1.5 m (**5 foot**) on center, become visually separated. This occurs frequently on low speed urban highways with sharp curves and short transition areas. This also occurs where there are steep grades and dips.
- Areas with high ambient lighting which may diminish the retroreflective capabilities of the markers.

When TRPMs are used to **supplement** a line, the following guideline applies, unless otherwise indicated in the Plan or directed by the Engineer:

- Solid Line - place TRPMs, 3 m (**10 foot**) on center.
- Double Solid Line - place two (2) TRPMs separated by 100 mm (**4 inches**) side-by-side, using the same spacing required for Solid Lines.
- Broken Line – place two (2) TRPMs to supplement each broken line segment.

Types of TRPMs

The TRPMs are classified into four types as follows:

- TRPM Type 1 - These markers are acceptable for use on all roadways for short or long term projects. They may be used to supplement or simulate solid or broken lines.
- TRPM Type 2 - These markers are acceptable for use on projects with Average Daily Traffic (ADT) of less than 3,000. They may be used to supplement or simulate solid or broken lines.
- TRPM Type 3 - These markers are acceptable for use on all roadways for short or long term projects. They may be used to supplement solid or broken lines. These markers are **NOT** acceptable to simulate solid or broken lines. If these markers do not conform to the color requirements herein they shall not be placed directly on the pavement marking line.
- TRPM Type 4 - These markers are acceptable for use on chip or sand sealing operations. These markers are designed to be placed prior to the sealing operation with a protective cover that is removed after the seal coat is applied.

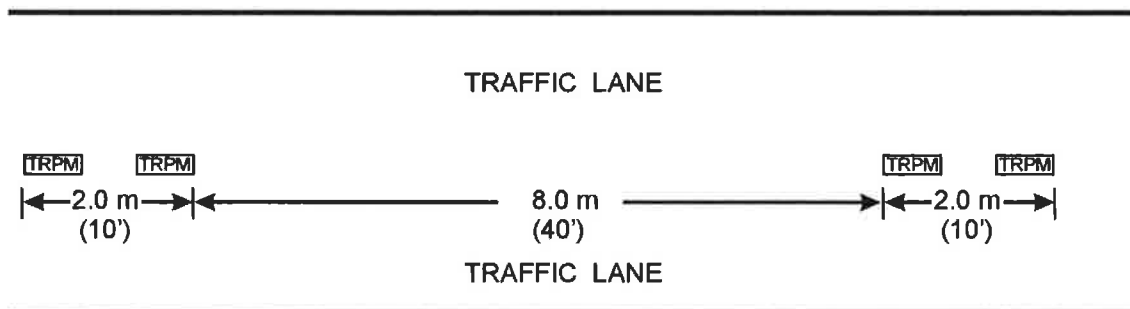
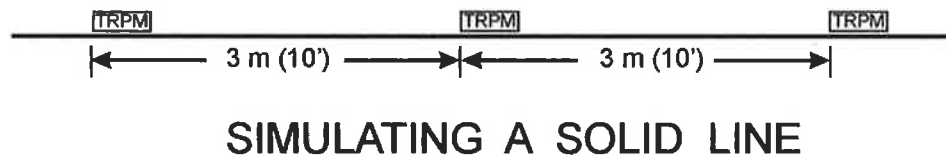
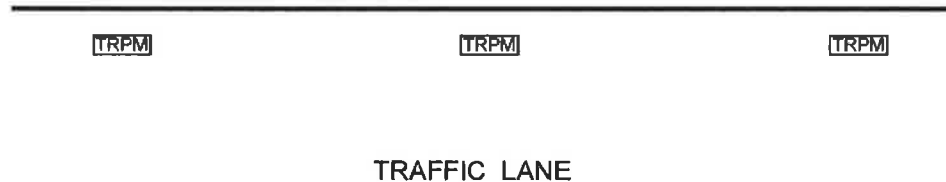
A list of approved raised pavement markers of each type is available on the Qualified Products List (QPL) for Work Zones, posted on the Office of Traffic, Security and Operations website at <http://www.dot.state.mn.us/trafficeng/products/index.html>

Installation, Maintenance and Removal

Installation, maintenance and removal of the TRPMs shall be done on a continuous basis as directed by the Engineer. The Contractor shall remove all containers, wrappers and used or damaged markers, etc. from the job site at the time of installation, during the project, and at the time of removals. All TRPMs shall be new and unused when placed.

Damaged or missing TRPMs shall be replaced by the Contractor within twenty-four (24) hours after notification by the Engineer, at no cost to the Department.

Prior to installing TRPMs, the pavement surface shall be air blown or brushed to remove surface dust and dirt. The TRPMs shall then be fixed to the pavement surface as per the manufacturer's recommendation.



SIMULATING A BROKEN LINE (10 m (50') CYCLE)

SPECIFICATIONS for TEMPORARY RAISED PAVEMENT MARKERS (TRPMS)

This specification provides four types of Temporary Raised Pavement Markers (TRPMs) for use in highway work zones.

GENERAL DESCRIPTION

The TRPMs used shall conform to the following specifications:

Color Requirements

TRPM TYPE 3 is not required to meet these daytime color requirements. ALL TRPM Types shall appear the same color at night as the pavement markings they simulate or supplement.

All TRPM Types 1, 2, and 4 shall conform to the following requirements:

White TRPMs shall conform to color number 17778 of the Federal Standard Number 5952 for daytime visibility.

Yellow TRPMs shall conform to the Federal Highway Administration's (FHWA's) Yellow Color Tolerance Chart for daytime visibility.

A document certifying that the markers meet the above color standards shall be included with each shipment.

Number of Retroreflective Surfaces

All white TRPMs shall contain a one way reflector unless otherwise specified. This means that only one face of the marker contains a retroreflective surface. All yellow TRPMs shall contain a two way reflector unless otherwise specified. This means that both faces of the marker shall contain a retroreflective surface. If this is not possible, then two (2) markers installed back-to-back shall be used to provide two way reflectivity when needed as shown in the Plans or directed by the Engineer.

SPECIFICATIONS – NO. 1
PATTERNED PREFORMED POLYMER PAVEMENT MARKING TAPE
WITH IMPROVED RETENTION OF REFLECTIVITY
FOR LINES AND SELECTED SYMBOLS AND LEGENDS

1.0 DESCRIPTION

The work shall consist of furnishing and installing longitudinal, highly durable retroreflective preformed pliant polymer patterned pavement marking tape with improved retroreflective retention, hereinafter referred to as patterned tape, on bituminous pavements in accordance with these provisions and in reasonable close conformance to the dimensions and lines shown on the Plans and/or as directed by the Engineer. Placement on hot bituminous surfaces by an inlay procedure is generally specified. However, overlay procedures may be required. Patterned tape may be applied to concrete surfaces immediately following appropriate preparation of the surface. Also, legends and symbols may be specified using inlay and/or overlay procedures.

2.0 MATERIALS AND REQUIRED PROPERTIES

2.1 GENERAL – Patterned tape, legends, and symbols shall be made of highly durable pliant polymer materials designed for markings subjected to high traffic volumes and severe wear conditions such as shear action associated with encroachment and crossover traffic on typical longitudinal pavement striping for center lines, lane and edge lines. STOP LINES and CROSSWALKS are generally not specified under this material.

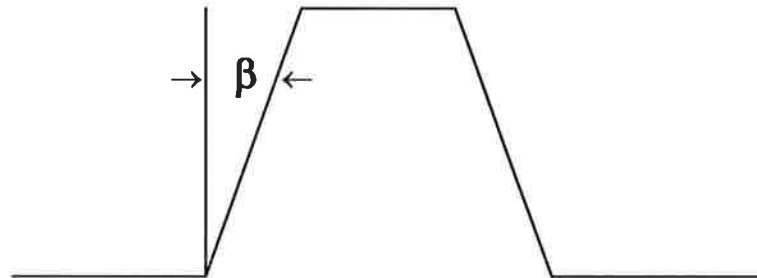
The pavement markings shall be capable of application to new, dense and open-graded asphaltic concrete wearing courses during the bituminous paving operation in accordance with the manufacturer's instructions. The preformed material shall conform to pavement contours by the action of traffic. If solvents and primers are needed to assure adhesion and effective product performance, the manufacturer shall identify them and instruct the Contractor in their application on bituminous and concrete surfaces.

To the extent feasible, the following specifications and requirements for patterned tape apply to all selected legends and symbols.

2.2 ADHESIVE – Patterned tape shall be capable of adhering to new bituminous wearing courses during the paving operation. A pre-coated pressure sensitive adhesive shall be provided to bond the tape to hot bituminous or properly prepared concrete surfaces. The adhesive and other materials shall be compatible with a primer should it be necessary to precondition a pavement surface.

2.3 **SHELF LIFE** – Patterned tape shall be suitable for use one year after the date of receipt when stored in accordance with the manufacturer’s recommendations.

2.4 **COMPOSITION** – Patterned tape shall consist of a mixture of high quality polymeric materials, pigments and glass beads distributed through out its base cross-sectional area. Ceramic beads shall be bonded to a durable, polyurethane topcoat surface. The patterned surface shall have 50% plus or minus 15% of the surface area raised and presenting a near vertical face (B angle of 0 degrees to 60 degrees) to traffic from any direction as illustrated below. The channels between the raised areas shall be substantially free of exposed beads or particles.



2.4 **BEADS**

2.5.1 **Retroreflectance** – The white and yellow patterned tapes shall have the following initial expected retroreflectance values as measured in accordance with the testing procedures of ASTM D 4061. The photometric quantity to be measured shall be specific luminance (SL), and shall be expressed as millicandelas per square foot per footcandle (mcd per sf per fc). The metric equivalent shall be expressed as millicandelas per square meter per lux. The test distance shall be 50 feet (15m) and the sample size shall be a 2.0 foot x 2.5 foot rectangle (0.61m x 0.76m).

2.5.2 **Initial Rectroreflectance Values**

	<u>WHITE</u>		<u>YELLOW</u>	
Entrance Angle in Degrees	86.0	86.5	86.0	86.5
Observation Angle in Degrees	0.2	1.0	0.2	1.0
Specific Luminance (SL)*	1100	700	800	500

* These retroreflectance values are based on dark room photometric reading per ASTM D 4061. The “Ecolux” retroreflectometer measures at this same approximate geometry, that is, 86.5 degrees entrance angle and 1.0 degree observation angle.

2.5.3 Ceramic and Glass Beads – All ceramic beads bonded to the polyurethane coated patterned surface shall have a minimum index of refraction of 1.70 when tested using the liquid oil immersion method. These instructions are available from Mn/DOT's Office of Materials and Research. Glass beads mixed into the pliant polymer shall have a minimum index of refraction of 1.5 when tested by the liquid oil immersion method.

2.5.4 The size and quality of all beads shall be such that the performance requirements for the retroreflective patterned tape shall be met.

2.6 ACID RESISTANCE – All beads shall show resistance to corrosion of their surface after exposure to a 1% solution (by weight) of sulfuric acid. The 1% acid solution shall be made by adding 5.7cc of concentrated acid into 1000cc of distilled water. CAUTION: Always add the concentrated acid into the water, no the reverse. The test shall be performed as follows:

Take a 1" x 2" sample, adhere it to the bottom of a glass tray and place just enough acid solution to completely immerse the sample. Cover the tray with a piece of glass to prevent evaporation and allow the sample to be exposed for 24 hours under these conditions. Then decant the acid solution (do not rinse, touch, or otherwise disturb the bead surfaces) and dry the sample while adhered to the glass tray in a 150 degree F (66 degree C) oven for approximately 15 minutes.

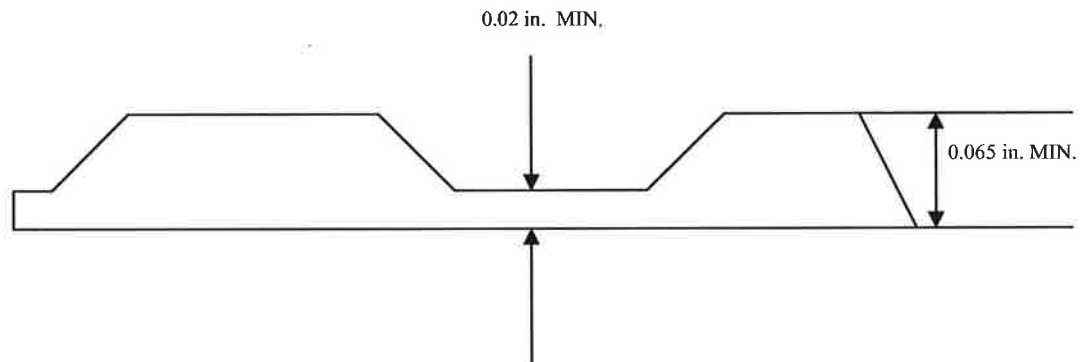
Microscopic examinations (20X) shall show no more than 15% of the beads having a formation of a very distinct opaque white (corroded) layer on their entire surface.

2.7 COLOR – The patterned tape shall consist of white and yellow films with pigments selected and blended to conform to standard highway colors per FHWA Color Chart 595a.

2.8 SKID RESISTANCE – The patterned surface of the retroreflective patterned tape shall provide an initial average skid resistance value of 45 BPN when tested according to ASTM E 303 except values will be taken at downweb and at 45 degree angle from downweb. These two values will then be averaged to find the skid resistance of the patterned surface.

2.9 PATCHABILITY – The patterned tape material shall be capable of use for patching worn areas of the same type of tape in accordance with the manufacturer's instructions.

2.10 **THICKNESS** – The pattern material without adhesive shall have a minimum caliper of 0.065 inches (1.651mm) at the thickest portion of the patterned cross-section and a minimum caliper of 0.02 inches (0.508mm) at the thinnest portion of the cross-section.



3.0 PERFORMANCE REQUIREMENTS

3.1 Patterned tape, symbols and legends placed on concrete and bituminous pavement, whether on hot or ambient surface temperatures, shall meet the following field performance requirements.

3.2 **ADHESION** – During the standard warranty granted by the manufacturer following the installation date of markings placed in accordance with the manufacturer's instructions and determined to be an inadequate traffic control device, replacement materials shall be provided by the manufacturer for material actually missing from the surface due to loss of adhesion* of complete wear-through.

* Overlay applications placed after September 15 are not recommended and are exempt from the adhesion loss performance. Also, inlaid and overlaid materials are exempt if their removal is caused by snowplow equipment.

3.3 **MINIMUM RETROFLECTANCE VALUES** – During the standard warranty period, pattern tape shall retain a minimum retroreflectance as follows:

	<u>WHITE</u>	<u>YELLOW</u>
Entrance Angle in Degrees	86.5	86.5
Observation Angle in Degrees	1.0	1.0
Average Value – SL*	100	100

* All retroreflectance measurements shall be made using an ECOLUX (trademark) brand retroreflectometer.

4.0 CONSTRUCTION REQUIREMENTS

4.1 GENERAL – Patterned tape shall be supplied in roll form without a protective liner, unless otherwise specified by the Engineer. Legend and symbols shall be supplied in accordance with the manufacturer's recommendations.

The polymer markings, when applied according to the recommendations of the manufacturer, shall provide a neat, durable marking that will not flow or distort due to resistant and, through normal traffic wear, shall show no fading, lifting or shrinking which will significantly impair the intended usage of the marking through out its useful life and shall show no significant tearing, roll-back or other signs of poor adhesion.

4.2 PRE-INSTALLATION – To assure a quality installation, the Contractor shall provide for the following materials control and services.

4.2.1 Certification of Materials Shipped – The manufacturer shall, by notarized letter, certify that the specified patterned tape in these provisions was shipped to the Contractor. The letter shall contain the following information:

1. State Project Number/Highway Number/Location
2. Name of Prime Contractor
3. Mn/DOT Spec. Number
4. Shipping Date
5. Project Names/Numbers/Quantities
6. Notary Seal

The notarized letter must be presented to the Engineer at least fifteen (15) calendar days prior to installing materials on the project.

4.2.2 Training of a Striping Contractor – The Contractor shall secure and cause application training seminars to enhance the installation of the pavement markings. This training shall address surface preparation and all application requirements and techniques necessary for successful pattern tape applications. Upon completion of the seminar for these personnel, the manufacturer of patterned tape shall provide written certification of approval to the Contractor in the following forms:

1. A certificate stating this approval and dated for one year. A copy of the certificate shall be on file with Mn/DOT.
2. Cards stating this approval and dated for one year will be given to each person approved and may be requested by state project personnel.

4.2.3 Equipment and Inlay Application Procedures – There are two types of application procedures, both of which may be required on a single project. Since training of installers is a requirement of this Specification, the MANUAL and MECHANICAL application procedures are not detailed herein but may be obtained from the Office of Traffic, Safety & Operations (651) 234-7373.

4.3 INSTALLATION CONTROLS AND DETAILS

4.3.1 Patterned tape, legends and symbols shall be applied in accordance with the details shown in the Special Provision, Plans, this Specification and control points established by the Engineer. The Contractor shall provide sufficient pavement marking material, equipment and manpower to keep abreast of the paving operations, including placement of legends and symbols, to insure proper inlayment of the materials.

4.3.2 Work Restriction – Application of patterned materials during hours of darkness will only be allowed by approval of the Engineer. On pavement to open to traffic, the work may be suspended by direction of the Engineer during peak traffic hours or at any other time traffic is being unduly hampered or delayed by the work in progress. Other restricting will be determined by provisions governing paving operations.

4.3.3 Alignment, Dimensions and Tolerances.

1. The Engineer will place necessary “spotting” at appropriate points to provide horizontal control for striping, and determine necessary starting and cutoff points. Skip line intervals will not be marked. Longitudinal joints and pavement edges shall serve as horizontal control when so directed.
2. Unless otherwise indicated all pavement striping shall be 4 inches wide. Skip lines shall be applied in lengths of 10 feet separated by gaps of 40 feet. The 50-foot cycle length is to be rigorously controlled and shall be carried through from day to day.
3. A tolerance of 1/8 inch under and 1/2 inch over the specified width will be allowed for striping provided the variance is gradual and does not detract from the general appearance. Skip line segments may vary up to 1/4 foot from the specified lengths provided the over and under variations are reasonable compensatory. Alignment deviations from the control guide shall not exceed 2 inches. Material shall not be applied over a longitudinal joint. Establishment of application tolerances shall not relieve Contractor of responsibility to comply as closely as practicable with the planned dimensions.

5.0 OVERLAY AND INLAY PROCEDURE

The Special Provisions or Plans of the Contract will indicate markings that are to be placed using the overlay procedure. Also, the overlay procedure may be necessary when conditions or events occur that prevent the use of the specified inlay procedure.

5.1 OVERLAY PROCEDURE SPECIFIED – Payment for pavement markings installed at contract prices per unit of material shall be compensation in full for all costs incurred in furnishing and installing, including surface preparation, use of primers, traffic control, and materials, all as recommended by the manufacturer and subject to the Engineer's approval.

5.2 INLAY PROCEDURE SPECIFIED BUT NOT USED.

5.2.1 Beyond Contractor's Control – When markings specified cannot be inlaid AND the Engineer determines that the Contractor had no control over the causation, the pavement markings shall be installed by the overlay procedure. The Contractor shall install the markings per instructions from the manufacturer and as approved by the Engineer. Surface preparation, including traffic control, shall be paid for under Specification 1904 – EXTRA AND FORCE ACCOUNT WORK.

5.2.2 If the Engineer determines that the "causation" in Section 5.2.1 was within the Contractor's control, the markings shall be installed by the overlay method, as ordered by the Engineer. Pay items (for inlaying) shall be used and are payment in full for all additional costs incurred, including traffic control.

6.0 ACCEPTANCE

Acceptance of the completed work shall be based on daytime and nighttime reviews conducted by the Engineer. The Engineer may order rework based on the day and/or night reviews.

SPECIFICATION – NO. 3
HIGH DURABILITY PREFORMED PAVEMENT MARKINGS
(Including Stop Lines and Crosswalks)

1.0 DESCRIPTION

The work shall consist of furnishing and installing retroreflective preformed polymer pavement markings for lane, center line and edge line longitudinal striping, work messages, symbols and particularly, stop lines and crosswalks. The marking may be applied to hot or ambient temperature bituminous surfaces and to properly prepared concrete surfaces. Work shall be accomplished in accordance with this provision and in reasonably close conformance to the dimension and lines shown on the Plans or established by the Engineer.

2.0 MATERIALS AND COMPONENT REQUIREMENTS

2.1. GENERAL

High durability preformed markings shall consist of white or yellow films with a urethane topcoat and glass beads distributed throughout to provide immediate and continuing retroreflection. Ceramic particles shall be bonded to the top urethane layer to provide a skid resistance surface. The edges of the preformed tape rolls shall be clean-cut and true.

Preformed works, symbols, stop lines and crosswalks shall conform to shapes and sizes as outlined in the "Minnesota Manual on Uniform Traffic Control Devices," dated 1991, or as modified.

All materials shall be of the highest quality as the markings will be subjected to severe wear conditions such as repeated shear actions from crossover or encroachment traffic or traffic turning stopping and starting.

2.2. REQUIREMENTS

2.2.1. Glass Beads – The size, quality and refractive index of the glass beads shall be such that the performance requirements for the markings shall be met. Bead adhesion shall be such that beads are not easily removed when the material surface is scratched with a thumbnail.

2.2.2. Glass Bead Retention – The film shall have glass bead retention qualities such that when a 2" x 6" (5.08cm x 15.24 cm) sample is bent over a 1/2" diameter mandrel, with the 2" dimension perpendicular to the mandrel axis, microscopic examination of the area on the mandrel shall show no more than 10% of the beads with entrapment by the binder of less than 40%.

- 2.2.3. Initial Reflectance – Pavement markings shall have the following initial minimum reflectance values as measured in accordance with ASTM D 4061. The photometric quantity to be measured shall be specific luminance (SL), and shall be expressed as millicandelas per square foot per footcandle [$\text{mcd ft}^{-2} \text{fc}^{-1}$]. The metric equivalent shall be expressed as millicandelas per square meter per lux. The test distance shall be 50 ft. (15m) and the sample size shall be a 2.0 x 2.5 ft. rectangle (0.61m x 0.76m).

		<u>White</u>			<u>Yellow</u>	
Entrance Angle	86.0	86.0	86.5	86.0	86.0	86.5
Observation Angle	0.2'	0.5'	1.0'	0.2'	0.5'	1.0'
Specific Luminance SL [$\text{mcd ft}^{-2} \text{fc}^{-1}$].	700	500	400	500	350	300

- 2.2.4. Reflectivity Retention – To have a good, effective performance life, the glass beads must be strongly bonded and not be easily removed by traffic wear.

The following test shall be employed to measure reflectivity retention:

Taber Abraser Simulation Test

Using a Taber Abraser with an H-18 wheel and a 125 gram load, the sample shall be inspected at 200 cycles, under a microscope, to observe the extent and type of bead failure.

No more than 15% of the beads shall be lost due to pop-out and the predominant mode of failure shall be “wear down” of the beads.

- 2.2.5. Thickness – The film, without adhesive, shall be a minimum thickness of 0.60”(1.50mm).
- 2.2.6. Tensile Strength and Elongation –The film shall have a minimum tensile strength of 150 pounds per square inch of cross-section when measured in the direction of the length of roll and tested in accordance with ASTM D 638-76, except that a sample 6” x 1” (15.24cm x 2.54cm) shall be tested at a temperature between 70°F and 80°F using a jaw speed of 10 to 12 inches per minute. The sample shall not exceed an elongation of 50% at break when tested by this method.
- 2.2.7. Skid Resistance – The surface of the retroreflective film shall provide an initial average skid resistance value of 55 BPN when tested in accordance with ASTM E 303.
- 2.2.8. Patchability – The pavement marking film shall be capable of use for patching work areas of the same type of film in accordance with manufacturer’s instructions.
- 2.2.9. Color –The pavement markings shall consist of white and yellow films with pigments selected and blended to conform to standard highway colors. White material

shall be no darker or yellower than chip 17778 of Federal Standard 595a. The color yellow shall be reasonable close to color chip 13538 of the Federal Standard No. 595a.

- 2.2.10. Adhesive – All pavement markings shall be pre-coated pressure sensitive adhesive to bond the tape to the surface of the roadway. The adhesive and other materials shall be compatible with a primer should it be necessary to precondition a pavement surface and is so ordered by the Engineer.
- 2.2.11. Primer – The manufacturer of the markings shall recommend an appropriate primer when the overlay procedure is specified or becomes a necessary installation procedure.
- 2.2.12. Shelf Life – The markings shall be suitable for use up to one year after the date of receipt when stored in accordance with the manufacturer's recommendations.

3.0 PERFORMANCE REQUIREMENTS

- 3.1. Pavement marking tapes, symbols and legends placed on concrete and bituminous pavements, whether on hot or ambient surface temperatures, shall meet at least the following field performance requirements.
- 3.2. Adhesion – During the standard warranty granted by the manufacturer following the installation date of markings placed in accordance with the manufacturer's instruction and determined to be an inadequate traffic control device, supply materials shall be provided by the manufacturer for material actually missing from the surface due to loss of adhesion¹ or complete wear-through.
- 3.3. A minimum retroreflectance level is not offered on these markings.

4.0 CONSTRUCTION REQUIREMENTS

4.1. GENERAL

Marking tape shall be supplied in roll form without a protective liner, unless otherwise specified by the Engineer. Legend and symbols shall be supplied in accordance with the manufacturer's recommendations.

4.2. PRE-INSTALLATION

To assure a quality installation, the Contractor shall provide for the following materials control and services.

¹ Overlay application placed after September 1 are not recommended and are exempt from the adhesion loss performance. Also, inlaid and overlaid materials are exempt if their removal is caused by snow plow equipment.

- 4.2.1. Certification of Materials Shipped – The manufacturer shall, by notarized letter, certify that the specified products in these provisions were shipped to the Contractor. The letter shall contain the following information:

1. State Project Number/Highway Number/Location
2. Name of Prime Contractor
3. Mn/DOT Specification Number
4. Shipping Date
5. Product Names/Numbers/Quantities
6. Notary Seal

The notarized letter must be presented to the Engineer at least fifteen (15) calendar days prior to installing the materials on the project.

- 4.2.2. Training of a Striping Contractor – The Contractor shall secure and cause application training seminars to enhance the installation of the pavement markings. The training shall address surface preparation and all application requirements and techniques necessary for successful marking tape applications. Upon completion of the seminar for these personnel, the manufacturer of the marking tape shall provide written certification of approval to the Contractor in the following forms:

1. A certificate stating this approval and dated for one year. A copy of this certificate shall be on file with Mn/DOT.
2. Cards stating this approval and dated for one year will be given to each person approved and may be requested by state project personnel.

- 4.2.3. Equipment and Inlay Application Procedures – There are two types of application procedures, both of which may be required on a single project. The MANUAL and MECHANICAL application procedures are not detailed herein but may be obtained from the Office of Traffic, Safety & Operations (651) 234-7373.

4.3. INSTALLATION CONTROLS AND DETAILS

- 4.3.1. Marking tapes, legends and symbols shall be applied in accordance with the details shown in the Special Provisions, Plans, this Specification and control points established by the Engineer.

- 4.3.2. Work Restrictions – Application of marking materials during hours of darkness will only be allowed by approval of the Engineer. On pavement open to traffic, the work may be suspended by direction of the Engineer during peak traffic hours or at any other time traffic is being unduly hampered or delayed by the work in progress. Other restricting will be determined by provisions governing paving operations.

4.3.3. Alignment, Dimensions and Tolerances

- A. The Engineer will place necessary “spotting” at appropriate points to provide horizontal control for striping and determine necessary starting and cut-off points. Skip line intervals will not be marked. Longitudinal joints and pavement edges shall serve as horizontal control when so directed.
- B. Unless otherwise indicated all pavement striping shall be 4 inches wide. Skip lines shall be applied in lengths of 10 feet separated by gaps of 40 feet. The 50-foot cycle length is to be rigorously controlled and shall be carried through from day to day.
- C. A tolerance of 1/8 under and 1/2 inch over the specified width will be allowed for striping provided the variance is gradual and does not detract from the general appearance. Skip line segments may vary up to 1/4 foot from the specified lengths provided the over and under variation are reasonable compensatory. Alignment deviations from the control guide shall not exceed 2 inches. Material shall not be applied over a longitudinal joint. Establishment of application tolerances shall not relieve the Contractor of his responsibility to comply as closely as practicable with the planned dimensions.

4.4. FINAL PRODUCT

The films, when applied according to the recommendations of the manufacturer, shall provide a neat, durable marking that will not flow or distort due to temperature if the pavement surface remains stable. The film shall be weather resistant and, through normal traffic wear, shall show no fading, lifting or shrinking which will significantly impair the intended usage of the marking throughout its useful life and shall show no significant tearing, roll-back or other signs of poor adhesion.

5.0 PAVEMENT MARKING BY OVERLAY PROCEDURE

The Special Provisions or Plans of the Contract will indicate markings that are to be placed using the overlay procedure. Also, the overlay procedure may be necessary when conditions or events occur that prevent the use of the specified inlay procedure.

5.1. OVERLAY PROCEDURE SPECIFIED

Payment for the accepted quantities of pavement markings installed at contract prices per unit of material shall be compensation in full for all costs incurred in furnishing and installing, including surface preparation, use of primers, and traffic control, the materials, all as recommended by the manufacturer and subject to the Engineer's approval.

5.2. INLAY PROCEDURE SPECIFIED NOT USED

5.2.1. Beyond Contractor's Control – When markings specified cannot be inlaid AND the Engineer determines that the Contractor had no control over the causation, the pavement markings shall be installed by the overlay procedure. The Contractor shall install the markings per instruction from the manufacturer and as approved by the Engineer. Surface preparation, including traffic control, shall be paid for under Specification 1904 – EXTRA AND FORCE account work.

5.2.2. If the Engineer determines that the “causation” in Section 5.2.1 was within the Contractor's control, the markings shall be installed by the overlay method, as ordered by the Engineer. Pay items (for inlaying) shall be used and are payment in full for all additional costs incurred, including traffic control.

6.0 ACCEPTANCE

Acceptance of completed work shall be based on daytime and nighttime reviews conducted by the Engineer. The Engineer may order rework based on the day and/or night reviews.

ATTACHMENT
SPECIFICATIONS FOR EPOXY RESIN PAVEMENT MARKINGS
(FREE OF TOXIC HEAVY METALS)

NOTE: Section 10.0 has been revised in the Special Provisions

1.0 DESCRIPTION

The work shall consist of furnishing and installing reflectorized white and yellow two-component, 100 percent solids epoxy pavement markings. Applications are lines, legends, symbols, crosswalks and stop lines placed on properly prepared asphaltic and portland cement concrete pavement surfaces in accordance with the Special Provisions, Plans, this Attachment and as directed by the Engineer. Upon curing, the materials produce pavement markings of specified thickness, width and retroreflectivity that resist wear from high traffic volumes for several years. During darkness and weather permitting, yellow markings shall be readily distinguishable from white markings.

Values stated in the International System of Units SI apply only to projects to be constructed in Metric units of measure. Values stated in inch-pound units (in parenthesis) apply only to projects to be constructed in English units of measure.

2.0 QUALIFICATIONS

- 2.1 Epoxy striping is a technical process requiring specialized equipment, quality controlled materials and well-trained operators to produce functional, long life pavement markings. To minimize application failures, Mn/DOT requires epoxy materials, beads, the pavement marking contractor, and striper to be approved prior to the bidding process.
- 2.1.1 A pavement marking contractor and/or equipment may be qualified as follows:
1. No previous epoxy striping on any construction contract-- contact Mn/DOT to arrange for field demonstration.
 2. Recent epoxy striping experience with other state transportation departments-- contact Mn/DOT and provide experience summary, including names of persons to be contacted.
 3. If striper is new, contact Mn/DOT to arrange for field demonstration.
 - 2.1.2 Before any epoxy product is acceptable for bid, it shall be field tested, evaluated, approved and assigned a product identification number by the Mn/DOT Materials Engineering Section. An approved product is placed on the APPROVED PRODUCTS LIST which is shown in Section 2.1.4.
 - 2.1.3 No change in product identification, chemical composition as indicated by infrared spectrophotometry and/or chemical analysis, or changes in the application requirements will be allowed. Any such changes shall be submitted for further evaluation.

Mn/DOT EPOXY PAVEMENT MARKING MATERIAL
APPROVED PRODUCTS LIST

2.1.4

Fast Dry (Type I)

<u>Manufacturer</u>	<u>Product</u>	<u>Appr Date</u>
Polycarb Inc.	MARK 55.3	1998
Epoplex	LS 50	1998

<u>Slow Dry (Type II)</u>		
<u>Manufacturer</u>	<u>Product</u>	<u>Appr Date</u>
Polycarb Inc.	MARK 55	1991
Epoplex	LS 60	1998

3.0 MATERIAL CLASSIFICATIONS

- 3.1 This specification provides for the classification of epoxy resin pavement marking systems by type.
- 3.1.1 Type I - A fast cure material suitable for line applications and, under ideal conditions , may not require coning.
- 3.1.2 Type II - A slow cure material suitable for all applications of pavement markings under controlled traffic conditions, i.e., coning is required and flagging may be as directed by the Engineer.
- 3.1.2 **Only Slow Dry Type II epoxy material shall be used for epoxy pavement markings except when specified as otherwise in the Special Provisions.**

4.0 EPOXY AND BEAD REQUIREMENTS

- 4.1 Epoxy Resin Material
- 4.1.1 The material shall be composed of epoxy resins and pigments only. No solvents are to be given off to the environment upon application to a pavement surface.
- 4.1.2 The composition shall be within the tolerance permitted for the product tested and approved by Mn/DOT. Type II material shall be completely free of TMPTA (Tri-Methylol Propane Tri-Acrylate) and other multi-functional monomers.
- 4.1.3 **All materials shall be free of lead, cadmium, mercury, hexavalent chromium and other toxic heavy metals as defined by the United States Environmental Protection Agency.**
- 4.1.4 Color -- The color of the white epoxy shall be a pure flat white, free of tints. The color of the yellow epoxy shall closely match Color Number 33538 of Federal Standard 595 and shall conform to the following CIE Chromaticity limits using illuminant "C":

$$\begin{array}{l} x | 0.470 | 0.485 | 0.520 | 0.480 \\ y | 0.440 | 0.460 | 0.450 | 0.420 \end{array}$$

Daylight Directional Reflectance (Y), white, minimum 83
Daylight Directional Reflectance (Y), yellow, minimum 50

Testing will be according to :

Daylight Directional Reflectance	ASTM D 2805
Color	ASTM D 2805

- 4.1.5 Adhesion Capabilities -- When the adhesion of the material to portland cement concrete (the concrete shall have a minimum of 2,070 kPa (300 psi.) tensile strength) is tested according to American Concrete Institute Committee 403 testing procedure, the failure of the system must take place in the concrete. The concrete shall be 32°C when the material is applied, after which the material shall be allowed to cure for 72 hours at 23±2°C.
- 4.1.6 Abrasion Resistance -- When the abrasion resistance of the material is tested according to ASTM C 501 with a CS-17 wheel under a load of 1000 grams for 1000 cycles, the wear index shall be no greater than 82. (The wear index is the weight in milligrams that is abraded from the sample under the test conditions).
- 4.1.7 Hardness -- The Type D durometer hardness of the material shall be not less than 75 nor more than 90 when tested according to ASTM D2240 after the material has cured for 72 hours at 23±2°C.
- 4.1.8 Tensile Strength -- The tensile strength of the material, when tested according to ASTM D 638, shall not be less than 41,370 kPa (6,000 psi.) after 72 hours cure at 23±2°C.
- 4.1.9 Compressive Strength -- The compressive strength of the material, when tested according to ASTM D 695, shall not be less than 82,700 kPa (12,000 psi.) after 72 hours cure at 23±2°C.
- 4.1.10 Shelf Life -- The individual components shall not require mixing prior to use when stored for a period of 12 months.
- 4.2 Glass Beads
 - 4.2.1 Glass beads shall meet the requirements of AASHTO M247, Type I, and:
 - a. Coatings -- the beads shall be treated according to the manufacturers recommendations and meet the requirements of Section 4.4.2 of M247, and
 - b. Roundness-- the beads shall have a roundness of at least 80%.
 - 4.2.2 For 380 µm (15 mil) applications, glass beads shall be applied at a rate of at least 3.0 kg/L (25 lb./gal.). **A greater bead application rate may be necessary for meeting the performance criteria (minimum levels of retroreflectivity). This will require contractors to consult with all the material manufacturers.**
- 4.3 Time to No-Track -- Type I material shall be in "no-tracking" condition in 15 minutes or less and within 45 minutes for Type II material. The "no-tracking" condition shall be determined on an application of specified thickness to the pavement and covered with glass beads at the rate of at least 3.0 kg/L (25 lb./gal.). The lines for this test shall be applied with striping equipment operated so as to have the material at manufacturer's recommended application temperature. This maximum "no-tracking" time shall not be exceeded when the pavement temperature varies from 10 to 49° C (50 to 120° F) and under all humidity conditions, providing the pavement is dry. The no-tracking time shall be determined by passing over the line with a passenger car or pickup truck at a speed of 40 to 55 kmph (25 to 35 mph) in a simulated passing maneuver. A line showing no visual deposition of the material to the pavement surface when viewed from a distance of 15 m (50 ft.) shall be considered as showing "no-tracking" and conforming to this requirement for time to "no-track."

5.0 APPLICATION EQUIPMENT AND PROCEDURES

5.1 Equipment

- 5.1.1 Equipment furnished shall include an applicator truck of adequate size and power, designed to apply an epoxy resin material and glass beads in a continuous or intermittent line pattern. The equipment shall be capable of placing stripes on the left and right sides. The left carriage shall be capable of placing two lines simultaneously with either line in a solid or intermittent pattern in yellow or white. With change in color usage, an amount of material equal to fifteen 3 m (10 ft.) stripes shall be wasted to eliminate the change of the incorrect color being applied.
- 5.1.2 The applicator truck (striper) and other vehicles in the striping train shall have permanently mounted Type C flashing arrowboards. They shall be visible to oncoming or following traffic, depending on the type of line being placed. Arrowboard requirements are detailed in the "Field Manual" of the *Minnesota Manual of Traffic Control Devices*. Also, truck equipment shall be capable of accumulating the footage applied per gun, individually each day. Only material application shall activate the footage accumulators. The readout shall be digital and not adjustable.
- 5.1.3 The equipment shall be capable of applying glass beads in a pressurized system at a rate of at least 3.0 kg/L (25 lb./gal.). **A greater bead application rate may be necessary for meeting the performance criteria (minimum levels of retroreflectivity). This will require contractors to consult with all the material manufacturers.**
- 5.1.4 All guns on the spray carriages shall be in full view of the operator(s) during operation.
- 5.1.5 Each crew shall include at least one technical expert knowledgeable in equipment operation, application techniques, control of traffic, and safety regulations.

5.2 Procedures

- 5.2.1 Pavement markings shall be placed in accordance with the details shown in the Plans and the control points established by the Engineer.
- 5.2.2 The road surface shall be cleaned at the direction of the Engineer just prior to an application. Pavement cleaning shall consist of at least brushing with a rotary broom (non-metallic), or as recommended by the material manufacturer and acceptable to the Engineer. New Portland cement concrete surfaces shall be sandblasted clean to remove any surface treatments and/or laitance. On low speed [Speed Limit 65 km/h (40 mph) or less] urban portland cement concrete roadways, sandblast cleaning shall be used for all epoxy pavement markings.
- 5.2.3 If the roadway surface is dry, the epoxy material application shall immediately follow the pavement cleaning and be preceded by an air blast. However, markings shall not be applied when the wind or other conditions cause a film of dust to be deposited on the pavement surface before the material can be applied.
- 5.2.4 The Engineer will place necessary spotting at appropriate points as overall horizontal control for striping and to indicate necessary starting and cutoff points. Broken line intervals will not be marked. Longitudinal joints, pavement edges, and existing markings shall serve as control points when so directed.
- 5.2.5 A 380 μm (15 mil) epoxy line requires a liter of mixed components for every 25.8 m (84.5 ft.) of 100 mm (4 in.) wide line. Field measurements are inserted into the following equation: $\text{Line Thickness in micrometers} = \frac{\text{Liters} \times 0.001 \times 10^{-3} \times \text{m}^3}{\text{Length in meters} \times \text{width in meters}}$ (Thickness in inches = Gallons x 231 cubic inches divided by the quantity Length (inches) x Width (inches)). Use 3.785 liters per gallon if epoxy is metered in gallons.

- 5.2.6 The minimum line width shall be its nominal width with 6 mm (¼ in.) greater than the nominal width allowed provided the variation is gradual and does not detract from the general appearance. Broken line segments, normally 2 m (6.56 ft.) every 10 m (32.81 ft.), may vary up to 75 mm (3 in.) from the specified lengths provided the over and under variations are reasonably compensatory. Alignment deviations from the control guide shall not exceed , except when approved by the Engineer. Material shall not be applied over a longitudinal joint. Establishment of application tolerances shall not relieve the Contractor of his responsibility to comply as closely as practicable with the planned dimensions.
- 5.3 Spraying Operation
- 5.3.1 Placement of epoxy materials shall be permitted only on a clean, dry pavement surface and air and pavement temperatures at least 10° C (50° F) unless the manufacturer, in writing, approves a lower temperature.
- 5.3.2 Two parts of epoxy component A (pigment) and one part component B (hardener) shall be heated separately at 43°±1° C (110°±30° F) and thoroughly mixed. All material heated over 60° C (140° F) shall be discarded. The sprayed epoxy shall be applied at 43°±1° C (110°±30° F) **or as recommended by the manufacturer.**
- 5.3.3 Glass beads shall be applied immediately after the placement of the epoxy. If two bead gradations are required by the Special Provisions, two bead dispensers are required to deliver the specified drop rates. Otherwise the dispenser system must deliver at a minimum 3.0 kg (25 lb./gal.) of beads per liter of epoxy material. **A greater bead application rate may be necessary for meeting the performance criteria (minimum levels of retroreflectivity). This will require contractors to consult with all the material manufacturers.**
- 5.3.4 The Contractor shall cooperate with inspection personnel in reviewing operation of the equipment, safety precautions, measurement of materials (components and beads), computations to determine specific and daily application rates, sampling materials, making other measurements, such as epoxy thickness, and notifications as to work schedule.
- 5.3.5 **Only Type II epoxy material shall be used for epoxy pavement markings except when specified as otherwise in the Special Provisions.**
- 5.3.6 Traffic control for the pavement marking operations shall be in substantial conformance with the "Field Manual," *Minnesota Manual of Uniform Traffic Control Devices* . **A shadow vehicle with a truck-mounted attenuator shall be used on high speed [SPEED LIMIT (65 km/h) (40 mph) and greater], high volume (ADT 1500 and greater) highways.**

6.0 SAMPLING RATE & PROCEDURES

- 6.1 One pint samples of each manufacturer's lot or batch furnished for the contract shall be **submitted to Mn/DOT at the time of manufacturing.** One pint samples of both Part A (yellow/white) & part B must be submitted to the Mn/DOT Materials Laboratory, 1400 Gervais Ave., Maplewood, Minnesota 55109. (612) 779-5550 or 5549, FAX: (612) 779-5616. Samples shall be identified as follows:
- | | | | |
|----|-------------------------------|----|---------------------------------|
| 1. | Manufacturer's Name | 5. | Color |
| 2. | Manufacturer's Product Number | 6. | Intended state project numbers. |
| 3. | Lot/Batch Number | | |
| 4. | Date Manufactured | | |
- 6.2 Contractors will not be allowed to use material that has not meet the requirements of Sections 6.1 & 7.0. Contractors will be asked to remove material that does not conform to Sections 6.1 & 7.0 and replace with material that does.

7.0 CERTIFICATIONS

- 7.1 The manufacturer shall certify that the components meet the requirements of these specifications and are on the Mn/DOT Approved Product List.
- 7.2 Certifications shall be sent along with the samples in section 6.1.

8.0 CONTAINER MARKINGS

- 8.1 Containers for epoxy components shall be marked with the manufacturer's name, product identification number, lot or batch number, date of manufacture, color, net weight of contents.
- 8.2 Containers for glass beads shall be marked with the name of manufacturer, the wording "Glass Beads," lot or batch number, coating type, date manufactured, and the net weight.

9.0 ACCEPTANCE OF PAVEMENT MARKINGS

In order to be a long-life pavement marking, epoxy markings placed in Minnesota must retain a satisfactory level of retroreflectivity in addition to demonstrating good adhesion, resisting chipping, and exhibiting proper daytime and nighttime colors. These attributes have been observed and evaluated for several years and are the basis for acceptance/rejection procedures and values used herein.

- 9.1 Retroreflectivity
- 9.1.1 Acceptable Minimum Retroreflectivity Values

MINIMUM AVERAGE RETROREFLECTIVITY VALUES FOR EPOXY MARKINGS (mcd/m²/lux)

<u>Period</u>	<u>White</u>	<u>Yellow</u>
Initial*	300	200
After-One-Winter*	175	140

* Described in Section 9.1.4 Miscellaneous Traffic Controls, Numbers 4 and 5.

- 9.1.2 Retroreflectometers-- Measurements shall be taken with either a portable or mobile retroreflectometer conforming to 30-meter geometry which is defined as: the entrance angle (the angle between the illumination axis and the retroreflector axis) shall fall between 88.50° and 88.76° and the observation angle (the angle between the illumination axis and the observation axis) shall fall between 1.0° and 1.05°; and, the co-viewing angle (the complement of the entrance angle) shall fall between 2.29° and 2.50°. All retroreflectivity readings and data analysis will be provided by Mn/DOT at no cost to the Contractor. Mn/DOT reserves the right to:
- make daytime and/or nighttime visual inspections with or without the presence of the Contractor's representative, mainly to locate obvious or suspect areas of deficiency, and
 - determine retroreflectivity of symbols, legends and lines wider than 200 mm (8 in.) using the portable retroreflectometer only.
- 9.1.3 Test Segments -- The following methodology will be used to evaluate retroreflectivity performance of in-service longitudinal line pavement markings:

LENGTH AND NUMBER OF TEST SEGMENTS^a PER ROADWAY^b PER LINE TYPE^c

Length of Roadway	Number of Test Segments	Length of Test Segments
Less than 1.5 km (1 mi.)	1	300 m (0.2 mi.)
Greater than or equal to 1.5 km (1 mi.)	1 per 1.5 km (1 mi.)	300 m (0.2 mi.)

- ^a TEST SEGMENTS-- Areas of a roadway chosen for measuring retroreflectivity of the line types.
- ^b ROADWAY--As used here, means that portion of a street or highway ordinarily used for vehicular traffic. In the event a street or highway includes two or more separate roadways, the term roadway shall refer to each roadway separately.
- ^c LINE TYPE-- Longitudinal lines of the same color and function. For example, white and yellow edge lines are each a line type.

9.1.4 Measurements in Test Segments

Portable Retroreflectometer

1. Take a minimum of 20 readings in each test segment per line type.
2. On broken lines (skip striping), measure every other stripe, taking no more than two readings per stripe with readings 0.5 m (20 in.) from the ends of the marking.
3. For solid lines, divide test segment into ten areas of 30 m (100 ft.); space readings a minimum of 10 m (33 ft.) and a maximum of 30 m (100 ft.) apart.
4. For 10 percent of each message type, take 5 readings on each message line; for 10 percent of each symbol type, take 5 readings on each symbol.
5. Upon completion of the evaluation, regardless of the results, additional test segments may be ordered by the Engineer.

Mobile Retroreflectometer

1. Calibration of the instruments shall be in accordance with the manufacturer's instructions.
2. Retroreflectivity shall be measured at a minimum rate of 20 percent of each roadway length by line type.
3. Should another mobile unit be available, the maximum acceptable deviation for measurements made by the two different instruments of the same manufacturer and for the same roadway length shall be $\pm 10\%$.
4. Repeatability for the given mobile unit shall be $\pm 6\%$.
5. Upon completion of the evaluation, regardless of the results, additional test segments may be ordered by the Engineer.

Miscellaneous Controls

1. Take measurements on a clean, dry roadway.
2. Collect data in direction of traffic flow.
3. Measurement units are: mcd/m²/lux.

4. Wait at least two (2) weeks from date of placement of the markings before taking initial readings.
5. Take after-one-winter readings in May or June to assure that spring rains have cleaned the beads.
6. Randomly select test segments unless night reviews or other knowledge supersedes a random selection process.
7. Measure each line type separately.
8. The Engineer may request additional readings or test segments.
9. In the event LASERLUX is not available, the Engineer may require the use of the portable retroreflectometer or establish an alternative evaluation plan.

9.1.5 Contents of Retroreflectivity Report

The report shall consist of:

- State Project number
- Trunk Highway number
- Test date
- Geographical location of the test site(s), including distance from the nearest permanent site identification, such as a reference point.
- Identification of the pavement marking material tested: type, color, age, and transverse location on the road
- Identification of the retroreflectometer
- Remarks concerning the overall condition of the line, messages and symbols such as carryover of asphalt, snow plow damage, uneven distribution of beads, etc.
- Average of the readings for each test segment with one standard deviation calculated.
- Average of the readings for each message and symbol type.

9.2 Correction of Defects/Penalties

1. All pavement markings not conforming to the requirements of the Contract shall be removed and replaced or otherwise repaired to the satisfaction of the Engineer. Removal of unacceptable work shall be accomplished with suitable blasting or grinding equipment unless other means are authorized by the Engineer.
2. Where yield computations show a deficiency in material usage of not more than 20 percent, Mn/DOT may require satisfactory repair or may accept the work at a reduced unit price which is in direct proportion to the percent of the deficiency. Where the deficiency in material usage exceeds 20%, Mn/DOT may require removal and replacement to the satisfaction of the Engineer unless other means are approved by the Engineer.
3. If the Engineer requires removal and replacement, the contractor shall remove (by an approved process) at least 90% of the deficient line, with no excessive scarring of the existing pavement. The removal width shall be one inch wider all around the nominal width of the pavement marking to be removed.

4. Where initial retroreflectivity falls below the minimum acceptable levels but not more than 20%, the Engineer may require satisfactory repair or may accept the work at a reduced unit price which is in direct proportion to the percent of the deficiency. Where the deficiency in retroreflectivity exceeds 20%, i.e., less than 240 mcd/m²/lux for white and 160 mcd/m²/lux for yellow, the Engineer may require the removal and replacement to the satisfaction of the Engineer unless other means are approved by the Engineer. Where minimum levels after one winter fall below the specified levels (170 mcd/m²/lux - 135 mcd/m²/lux), Mn/DOT will notify the project contractor and manufacturer(s) of the failure. If the initial readings were above Mn/DOT's specified initial minimum levels (300 mcd/m²/lux - 200 mcd/m²/lux), the Engineer, contractor, and manufacturer(s) of the material(s) shall review the project together. Based on the review of all known aspects, the Engineer will make a determination as to why the job failed and notify the Contractor, pavement marking contractor, and/or manufacturer(s) in writing.
5. If this process has to be repeated on several projects with either the same contractor and/or manufacturer(s), Mn/DOT will take corrective action. This corrective action will be a two step process:

Step 1 Pavement marking contractor/manufacturer(s) will be considered not approved for Mn/DOT projects, except to bring workmanship/product back into compliance.

Step 2 If the first step cannot be attained, pavement marking contractor/manufacturer(s) will not be allowed to participate in Mn/DOT projects and/or be removed from Approved Product List.

10.0 DOCUMENTATION

~~Contractors applying epoxy pavement markings for Mn/DOT under a contract are required to fill out the attached "Construction Striper Operations Daily Log" form. These forms shall be completed at the end of each project and faxed to the "Reflective Systems Unit" at (612) 797-3181 Attn: Jim Carlson. Failure to submit completed forms may result in 10% of the overall contract price for epoxy pavement markings held back. Also, if forms are not sent in to the reflective systems unit in a timely manner projects will not be inspected during optimum times for meeting their performance criteria. Any questions regarding this form can be answered by calling the Reflective Systems Unit at (612) 797-3183.~~

S-262.1 Section 10.0 of the attached "Specification for Epoxy Resin Pavement Markings" is hereby deleted and the following substituted therefore:

Contractors applying epoxy pavement markings for Mn/DOT under a contract are required to fill out the attached "Construction Striping Report" form. These forms shall be completed at the end of each project. The original shall be given to the Engineer. Failure to submit completed forms may result in 10% of the overall contract price for epoxy pavement markings held back. The Engineer will fax them "ATTN: Pavement Marking Engineer" at 651-234-7370. If forms are not sent in to the reflective systems unit in a timely manner projects will not be inspected during optimum times for meeting their performance criteria. Any questions regarding this form can be answered by calling the Pavement Marking Engineer at (651) 234-7373. The form is on the website at:

<http://www.dot.state.mn.us/trafficeng/products/ContractorStripingDailyReportForm.doc>

**MINNESOTA DEPARTMENT OF TRANSPORTATION
SPECIFICATION
DROP-ON GLASS BEADS**

I. SCOPE

This specification covers treated glass beads for reflectorizing traffic marking paint.

II. GENERAL REQUIREMENTS

Beads for use with solvent-based paints will have a "dry flow" type surface treatment.

Beads for use with water-based paints will have a dual surface treatment consisting of a moisture resistant silicone treatment, and a silane adherence surface treatment.

Beads for use with epoxy paints will have a moisture resistant silicone surface treatment.

The beads will be made from clean colorless transparent glass. They will be smooth, spherically shaped, and free from milkiness, pits, excessive air bubbles, chips and foreign material. The beads will be suitable for application using conventional striping equipment, and will produce a retro-reflectorized line when viewed at night with automobile headlights.

III. SPECIFIC REQUIREMENTS

The glass beads will meet the requirements of AASHTO M 247 Type 1 "standard gradation" except the beads will have a minimum of 80 percent true spheres.

The dual treated beads will meet the moisture resistant requirements of AASHTO M 247 Section 4.4.2 and pass the adherence treatment Dansyl Chloride Test.

The moisture resistant silicone treated beads will meet AASHTO M 247 Section 4.2.2.

IV. SAMPLING AND TESTING

A. SAMPLING

The beads will be sampled at the rate of one sample per 4,000 kg (10,000 lbs) of beads. For beads shipped in 22 kg (50 lbs) bags a sample will consist of two bags selected at random and reduced to approximately one quart using a sample splitter. For bulk shipments, sampling will be by means of a perforated tube type "sampling thief." Three samples from each of three separate containers will be combined for one sample.

B. TESTING

Testing will be according to the requirements of AASHTO M 247.

Adherence coating will be tested by the Dansyl Chloride Method on file at the Mn/DOT Materials Laboratory.

Retroreflectivity will be determined by the Mn/DOT Method.

1. 3 draw downs (100 mm wide, 15 mil wet thickness) will be conducted in the lab for each color of paint.
2. Glass beads will be dropped on at a rate of 3.6 kg (8 lbs) per gallon.
3. 3 readings will be taken per draw down.
4. The average of those 9 readings will be the retroreflectivity of the system (paint and beads).

Roundness will be determined by the Mn/DOT Method detailed below.

Mn/DOT Method for Determining Roundness of Glass Beads.

1. Reduce sample to 25 to 50 grams by means of a sample splitter. Weigh to the nearest 0.01 grams.
2. Split the reduced sample into two fractions using a 297 μ m (No. 50) sieve.

3. To separate rounds from imperfections, a smooth, 30 mm by 45 mm (12 in by 18 in), inclined glass or aluminum plate is used. The plate is inclined at approximately 3 degrees for the +297 μm (+50) fraction and at approximately 10 degrees for the -297 μm (-50) fraction.

Slowly apply part of the beads to the top of the plate. Tap the plate with a wooden pencil or brush to cause round beads to roll down the incline into a collecting pan. Brush the remaining beads into a separate collecting pan. Continue with small applications until the entire sample is processed. Repeat the process with beads that rolled off plate at least three times for the +297 μm (+50) fraction and at least four times for the -297 μm (-50) fraction.

4. Weigh the separated fractions of round beads and calculate percent rounds.

V. PACKAGING

Unless otherwise specified the beads will be packaged in moisture-proof multi-wall shipping bags.

Each container will be marked with name and address of the manufacturer, type of moisture treatment, batch number and date of manufacture.

The containers and contents will be delivered in a good, dry condition.

Any beads not meeting the requirements of this specification or delivered in an unusable condition will be rejected.

Minnesota Department of Transportation Schedule of Materials Control – Introduction Page
(Federal Aid, State Funds, County/Municipal Federal Aid Projects and State Aid Projects)

This schedule outlines the minimum sampling and testing required for most materials used in highway construction. Some items that are rarely used or materials of recent development are often covered by special provisions and may not be shown on the schedule. For more information regarding contract requirements for testing, please reference the "Standard Specifications for Construction", Specification 1603 Materials: Specifications, Samples, Tests, and Acceptance.

Laboratories performing acceptance tests for payment shall be accredited by the AASHTO Materials Reference Laboratory (AMRL) or a comparable accreditation program approved by Mn/DOT and the FHWA for all test procedures performed.

When sample sizes required for testing exceed 35 pounds, please submit multiple containers of the material with no individual container weighing more than 35 pounds.

Small quantities of materials may be accepted without sampling and testing. A small quantity is defined as any total quantity, for the whole project, of one material, which is smaller than the minimum quantity required for testing unless modified by the individual material items. These materials shall be from known, reliable sources, perform satisfactorily and meet the requirements for purpose intended. The inspection report (Form 02415) should include a statement to this effect and show the source. Form 2403 may be used to report small quantities of diverse materials from different sources. Form 02415 and Form 2403 (or approved revisions) are referenced in the Schedule of Materials Control for project record documentation and are required to be maintained in the project file.

Where items of small quantity are used in a critical location or significantly influence the safety, performance, strength or durability of major construction items, prior approval for their use without testing must be obtained.

Previously approved materials transferred from another project should be reported on Form 02415. The report should include: type of material, quantities involved, source, and supplier of materials. Whenever possible, include the project number for which the material was originally approved.

If Forms 02415 and 2403 are referenced by form number within the Materials Control Schedule for materials or products received from pre-approved sources, where the field responsibility for acceptance is visual inspection and all information required to complete these forms is contained in other documents in the project file, the use of these forms becomes optional. If these forms are completed and sent to the Project Engineer by off-site inspection personnel from the district or the Office of Materials, they must be retained in the project file.

A telephone Index is included with the Schedule giving the numbers of contact persons if further information is required regarding the various materials. A form index is also included.

A website (www.dot.state.mn.us/materials.html) has been established for the Office of Materials. The contributing units to the Materials Control Schedule from the Pavement Engineering Section are the Bituminous Engineering Unit, the Concrete Engineering Unit, and from the Geotechnical Section, the Grading & Base Unit. The Department maintains the Approved/Qualified Products List and the Certified Products and Services List, as well as, the Schedule of Materials Control.

Products manufactured offsite may be pre-approved; however, final acceptance will be made at the point of incorporation, based upon review of documentation and inspection for shipping or other damage.

Contact the Mn/DOT District Independent Assurance Inspector when project starts to provide the proper servicing of your project.

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III. Sealcoat Construction Items for Specification 2356	18 thru 22
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Certifications List

Material	Section	Sub Section	Page	Certification Needed
All Granular Materials	I. Grading & Base	Many	7-11	Form 24346 and Test Results
Plant Mixed Asphalt (PMA)	II. Bituminous	Many	12-17	All PMA from certified supplier www.dot.state.mn.us/materials/bituminous.html
Shingles	II. Bituminous	2	13	Contractor shall provide documentation that of all RAS /TOSS (Tear Off Shingle) material is from a MPCA certified supplier.
Bituminous Material	II. Bituminous	9	16	Only Bituminous Materials from certified asphalt binder sources are allowed for use. The most current list of Certified Sources can at http://www.dot.state.mn.us/products
Emulsions	III. Seal Coat		19	Use Emulsion for seal coat from a certified asphalt emulsion source.
Emulsions	III. Seal Coat		19	Use Emulsion for Fog Seal from a certified asphalt emulsion source.
Emulsions	III. Micro surfacing		20	Use Asphalt Emulsion from a certified asphalt emulsion source.
Emulsions	III. Micro surfacing		21	Use Micro surfacing Emulsion from a certified asphalt emulsion source.
Emulsions	III. Micro surfacing		22	Use Fog Seal Emulsion from a certified asphalt emulsion source.
Concrete Ready Mix	IV. Concrete	Many	23-37	Contact Report from Ready-Mix Plant. All concrete from certified plant including a computerized certificate of compliance with each load.
Ground Granulated Blast Furnace Slag Fly Ash Admixtures Cement	IV. Concrete		24	Concrete Plant Batching Materials: All materials must come from certified approved, or qualified sources. All certified sources must state so on the Bill of Lading Delivery invoice including Mn/DOT standardized certification statement for cement, flyash, and slag. The most current list of certified/approved sources can be found at www.dot.state.mn.us/products .

Material	Section	Sub Section	Page	Certification Needed
Air Content	IV. Concrete ready-mix for concrete paving		29	Certificate of Compliance.
Plastic for Curing	IV. Concrete		32	A Certificate of Compliance shall be submitted to the Project Engineer from the Manufacturer certifying that the plastic complies with AASHTO M171.
Aggregate for Low Slump Overlays	IV. Concrete		36	Aggregate pit numbers and 1 passing gradation result per fraction each time aggregate is delivered to the site
Profiler	IV. Concrete		35	Contractor provides Mn/DOT certified Inertial Profiler Results for bumps/dips and/or Areas of Localized Roughness for the entire project.
Aggregate for Concrete Pavement Repair	IV. Concrete		37	Aggregate pit numbers and 1 passing gradation result per fraction each time aggregate is delivered to the site
Aggregate for Dowel Bar Retrofits	IV. Concrete		38	Aggregate pit numbers and 1 passing gradation result per fraction each time aggregate is delivered to the site
Plant Stock & Landscape Materials	V: Landscaping etc.	2	39	Several certifications
Silt Fence	V: Landscaping etc.	5	40	Certificate of Compliance with MARV values
Flotation Silt Curtain	V: Landscaping etc.	6	40	Manufacturers' certification of compliance
Mulch Type 3	V: Landscaping etc.	12	40	Certified Vendor by Minnesota Crop Improvement Association must be tagged grain straw only on label.
Mulch Type 6 Wood Chips	V: Landscaping etc.	13	41	Emerald Ash Borer Compliance Agreement with the MDA
Seeds	V: Landscaping etc.	14	41	Certified Vendor by Minnesota Crop Improvement Association must be tagged.
Seeds - Native	V: Landscaping etc.	14	41	Certified Vendor by Minnesota Crop Improvement Association must be tagged.
Sod	V: Landscaping etc.	15	41	A certified tag by Minnesota Crop Improvement Association for Salt tolerant sod. A certificate of Compliance for all other types of sod listing grass varieties.
Compost	V: Landscaping etc.	16	41	A/QPL with certified test reports.
Waterproofing material membrane waterproof system	VI: Chemical Items		42	Certificate and test results
Waterborne latex traffic marking paint	VI: Chemical Items		43	Certificate of Compliance
Epoxy traffic paint	VI: Chemical Items		43	Certificate of Compliance
Traffic marking paint	VI: Chemical Items		43	Certificate of Compliance
Non-traffic marking paint	VI: Chemical Items		43	Certificate of Compliance
Bridge structural steel paint	VI: Chemical Items		44	Certificate of Compliance
Exterior masonry paint	VI: Chemical Items		44	Certificate of Compliance
Noise wall stain	VI: Chemical Items		44	Certificate of Compliance
Drop-on glass beads	VI: Chemical Items		44	Certificate of Compliance
Pavement marking tape	VI: Chemical Items		44	Certificate of Compliance
Steel sign posts	VII: Metallic	2	46	Certification of domestic source if applicable under 1601.
Posts for traffic or fence	VII: Metallic	3A	46	Certification of domestic source if applicable under 1601. For fence: fence certification form.
Fence components	VII: Metallic	3B	46	Fence certification form.
Fence gates	VII: Metallic	3C	46	Fence certification form.
Fence barbed wire fabric	VII: Metallic	3D	46	Fence certification form.
Fence woven wire fabric	VII: Metallic	3E	47	Fence certification form.

Material	Section	Sub Section	Page	Certification Needed
Fence chain link wire fabric	VII: Metallic	3F	47	Fence certification form.
Reinforcing steel uncoated bars	VII: Metallic	5A	47	Certificate of Compliance & certified mill analysis
Reinforcing steel epoxy bars	VII: Metallic	5B	48	Inspected tag or Certificate of Compliance & certified mill analysis
Steel Fabric	VII: Metallic	5E	48	Certificate of Compliance
Dowel Bars	VII: Metallic	5F	48	Certificate of Compliance
Pre or post tensioning strand	VII: Metallic	5G	49	Mill analysis
Anchor rods & Structural Fasteners	VII: Metallic	7	49	Yearly Mn/DOT passing test report
Timber & lumber	VIII: Miscellaneous	1	53	Certified on invoice
Elastomeric bearing pad	VIII: Miscellaneous	4	53	Certificate of Compliance
Corrugated metal pipe	IX: Geosynthetics & Pipe	1A	53	Certified on invoice
Corrugated metal structural plate	IX: Geosynthetics & Pipe	1B	53	Certified on invoice
Corrugated metal aluminum plate	IX: Geosynthetics & Pipe	1C	54	Fabricator's Certificate and guarantee
Concrete pipe & manholes reinforced	IX: Geosynthetics & Pipe	3A	54	Certified stamp and certification document
Concrete pipe non reinforced	IX: Geosynthetics & Pipe	3B	54	Certified stamp and certification document
Precast box culverts	IX: Geosynthetics & Pipe	4A	55	Stamped & field inspection report
Prestressed beams & posts, etc	IX: Geosynthetics & Pipe	4B	55	Stamped & field inspection report
Manholes & catch basins	IX: Geosynthetics & Pipe	5	56	Certification document or stamped
Thermoplastic pipe ABS & PVC	IX: Geosynthetics & Pipe	7	56	Certificate of Compliance
Corrugated PE Pipe: Single wall – edge drains	IX: Geosynthetics & Pipe	8	56	Certificate of Compliance
Corrugated PE Pipe: dual wall – 12"-48"	IX: Geosynthetics & Pipe	13	57	Certificate of Compliance
Geotextile fabric	IX: Geosynthetics & Pipe	14	58	Manufacturers' Certification of compliance
Brick sewer concrete	X: Brick, Stone, Masonry	1B	59	Air content statement
Concrete masonry units	X: Brick, Stone, Masonry	2A	59	Air content statement
Light standards	XI: Electrical & Signal	1	60	Certificate of Compliance
Cable & Conductors	XI: Electrical & Signal	7	61	Usually inspected at the distributor. Documentation showing project number, reel number(s), & Mn/DOT test number(s) will be included with each project shipment. If not received from Contractor, submit sample for testing along with manufacturers' material certification.
Electrical systems	XI: Electrical & Signal	10	62	Electrical Systems are to be reported as a "System" using the Lighting, Signal, and Traffic Recorder Inspection Report.
Traffic signal systems	XI: Electrical & Signal	11	62	Traffic Signal Systems are to be reported as a "System" using the Lighting, Signal, and Traffic Recorder Inspection Report.

Telephone Index for Schedule of Materials Control

Section	Page	Section Name	Contact	Phone
Part I	Page 7	Grading & Base	Terry Beaudry Cary Efta Rebecca Embacher	(651) 366-5456 (651) 366-5421 (651) 366-5525
Website: www.dot.state.mn.us/materials/gradingandbase.html				
Part II	Page 12	Bituminous - Spec. 2360	John Garrity	(651) 366-5577
Part II B 4	Page 16	Asphalt Binder	Jim McGraw Jason Szondy	(651) 366-5548 (651) 366-5549
Website: www.dot.state.mn.us/materials/bituminous.html				
Part III	Page 18	Seal Coating – Spec 2356	Erland Lukanen Tom Wood	(651) 366-5460 (651) 366-5573
Part IV	Page 23	Concrete – Aggregates and Mix Design Concrete – Certified Ready Mix Concrete Paving Concrete – Bridges	Wendy Garr Wendy Garr Maria Masten Ron Mulvaney	(651) 366-5423 (651) 366-5423 (651) 366-5572 (651) 366-5575
Website: www.dot.state.mn.us/materials/concrete.html				
Part V	Page 39	Landscaping and Erosion Control Items Erosion Control Landscaping Wood Chips	Lori Belz Scott Bradley Tina Markeson	(651) 366-3607 (651) 366-4612 (651) 366-3619
Part VI	Page 42	Chemical Items	Jim McGraw Dave Iverson	(651) 366-5548 (651) 366-5550
Part VII	Page 45	Metallic Materials and Metal Products Sampling Test Results Bridge Structural Metals	Steve Grover Laboratory Todd Niemann Barry Glassman	(651) 366-5540 (651) 366-5560 (651) 366-4567 (651) 366-4568
Part VIII	Page 53	Miscellaneous Materials Sections 1 thru 3 Section 4 Test Results	Steve Grover Todd Niemann Barry Glassman Laboratory	(651) 366-5540 (651) 366-4567 (651) 366-4568 (651) 366-5560
Part IX	Page 53	Geosynthetics, Pipe, Tile, and Precast/Prestressed Concrete Sections 1 thru 11, & 13 Section 12 Section 14 Test Results	Steve Grover Rich Lamb Randy Tilseth Laboratory	(651) 366-5540 (651) 366-5595 (651) 366-5451 (651) 366-5560
Part X	Page 59	Brick, Stone and Masonry Units/Modular Retaining Wall Blocks Sections 1, 2A, 3, & 4 Section 2B Test Results	Steve Grover Blake Nelson Laboratory	(651) 366-5540 (651) 366-5599 (651) 366-5561
Part XI	Page 60	Electrical & Signal Sections 1, 8-11 Section 2, 4- 7 Section 3 Test Results	Susan Zarling Steve Grover Wendy Garr Laboratory	(651) 234-7052 (651) 366-5540 (651) 366-5423 (651) 366-5560

Form Index

Grading and Base	
Form No.	Form Name
02115-03	Grading & Base Report
02154-02	Random Sampling Gradations
2170-02	Penetration Index Method - Aggregate Base & Edge Drains
02402-03	Work Sheet for Sieve Analysis of Granular Material
02463	Percent Crushing Report
24346-02	Certificate of Aggregates & Granular Materials
24587-01	Calculation for Moisture - Density Relationships in Subgrade Soils and Aggregate Base and Shoulders
Concrete	
Form No.	Form Name
2152	Concrete Batching Report
2162	Concrete Test Beam Data
2409	ID Card Concrete Test Cylinder
2448	Weekly Concrete Report
2449	Weekly Concrete Aggregate Report (QC/QA)
21412	Weekly Report of "Low Slump Concrete"
21763	Concrete Aggregate Worksheet
21764	Concrete Aggregate Worksheet JMF
24143	Weekly Certified Ready-Mix Plant Report (Verification)
24300	ID Card Cement Samples
24308	ID Card Fly Ash Samples
24327	Field Core Report
	Concrete W/C Ratio Calculation Worksheet
	Incentive/Disincentive Smoothness Worksheet
Bituminous	
Form No.	Form Name
2413	Asphalt Sample Identification Card
Miscellaneous	
Form No.	Form Name
2410	Sample ID Card
02415	Inspection Report on..... (May be used for documentation or use another method to capture required documentation)
2403	Inspection Report for Small Quantities (May be used for documentation or use another method to capture required documentation)
	Certification Form for Type of Fence used, see on right side of page, www.dot.state.mn.us/materials/lab.html

I. Grading and Base Construction Items 2005 and 2011 Spec Book (www.dot.state.mn.us/materials/gradingandbase.html)

I. Grading and Base Construction Items 200S and 2011 Spec Book (www.dot.state.tx.us/initia/200S/GradingandBase.htm)							
Pay Item Number	Material	Spec. No.	Minimum Contractor Quality Control Testing Rate	Minimum Agency Verification (Acceptance) Testing Rate (see note 1)	Minimum Field Sample Size	Minimum Companion (Lab) Sample Rate & Size (See Note 2)	Form No. (See Note 4)
(a) 2118 (b) 2211 (c) 2221	1. Gradation. (a) Aggregate Surfacing (b) Aggregate Base. (c) Aggregate Shoulders	3138 & Special Provisions	Production: 1/1,000 ton Placement: 1/5,000 ton	Random Sampling a) For less than 2,200 yd ³ (CV) use Individual Tests 1 test /550 yd ³ b) For more than 2,200 yd ³ (CV) use lots. Maximum lot size is 5,500 yd ³ (CV). Average 4 tests/Lot	60 lb	1 per source 30 lb	02115-03, 02154-02, & 24346-02
		3149 & Special Provisions					
		Special Provisions					
(e) 2211	(e) Open Graded Aggregate Base (OGAB)	Special Provisions	4 per source before placing on project	1/550 yd ³ (CV)	None	1 per source 30 lb	02115-03, 24346-02, & 02402-03
(f) 2105	(f) Granular Borrow Select Granular Borrow	3149 & Special Provisions	1/10,000 yd ³ (CV) (See Note 2)	1/20,000 yd ³ (CV) (See Note 2)		1 per source 30 lb (Salvage Bit. See Note 3)	
(g) 2331	(g) Full Depth Reclamation (FDR)	Special Provisions	1/6,000 yd ²	1/12,000 yd ²	None	None	02115-03 & 02402-03
(h) 2511	(h) Granular Filter	3601 & Special Provisions	1 per source before placing on project	1 per source (See Note 2)	300 lb	1 per source 150 lb	02115-03, 24346-02, & 02402-03

Schedule of Materials Control

I. Grading and Base Construction Items (cont.)

Pay Item Number	Material	Spec. No.	Minimum Contractor Quality Control Testing Rate	Minimum Agency Verification (Acceptance) Testing Rate (See Note 1)	Minimum Field Sample Size	Minimum Companion (Lab) Sample Rate & Size (See Note 2)	Form No. (See Note 4)
(Continued)							
1. Gradation							
(i) 2451	(i) Granular Backfill	3149 & Special Provisions	2 per source before placing on project	1 per source (See Note 2)	60 lb	1 per source 30 lb (Salvage Bit. See Note 3)	02115-03, 24346-02, & 02402-03
(j) 2451	(j) Aggregate Backfill						
(k) 2451	(k) Granular Bedding						
(l) 2451	(l) Aggregate Bedding						
(m) 2451	(m) Coarse Filter Aggregate	3149 & Special Provisions				1 per source 30 lb	
(n) 2502	(n) Fine Filter Aggregate						
(o) 2206	(o) Sand Cover						
2. Moisture – Density Test (Required for Specified Density) (Proctor)							
(a) 2211	(a) Aggregate Base	2211, 2221, & Special Provisions	2005 Spec Book: Contractor is encouraged to perform tests 2011 Spec Book: 1 per source	2005 Spec Book: 1/25,000 yd ³ (per source) 2011 Spec Book: none	50 lb	One sample minimum 25 lb	24587-01
(b) 2221	(b) Aggregate Shoulder						
(c) 2105	(c) Embankment Soil (Excavation & Borrow)	2105	2005 Spec Book: Contractor is encouraged to perform tests 2011 Spec Book: 1 major soil type – See Note 6	2005 Spec Book: 1 per major soil type – See Note 6 2011 Spec Book: none		Two samples minimum 25 lb	
3. Relative Density Test (Required for Specified Density)							
(a) 2211	(a) Aggregate Base	2211 & Special Provisions	Contractor is encouraged to perform tests for process control.	1/1,000 yd ³ (CV)	None	None	02115-03 & 02140-03
(b) 2221	(b) Aggregate Shoulder						
(c) 2105	(c) Embankment Soil (Excavation & Borrow)	2105 & Special Provisions		1/4,000 yd ³ (CV)			

I. Grading and Base Construction Items (cont.)

Pay Item Number	Material	Spec. No.	Minimum Contractor Quality Control Testing Rate	Minimum Agency Quality Verification (Acceptance) Rate (See Note 1)	Minimum Field Sample Size	Minimum Companion (Lab) Sample Rate & Size (See Note 2)	Form No. (See Note 4)
(a) 2211 (b) 2221 (c) 2331 (d) 2502	4. Penetration Index Method (DCP) (a) Aggregate Base (b) Aggregate Shoulder	2211, 2221, & Special Provisions	Contractor is encouraged to perform tests for process control.	1 DCP test/500 yd ³ (CV)	None	None	02115-03 & 02170-02
	(c) Full Depth Reclamation (FDR)	1 DCP test/3,000 yd ²					
	(d) Fine Filter Aggregate (Edge Drains)	See Special Provisions					
	5. Modified Penetration Index Method (DCP) (Special Provisions) (a) Aggregate Base (b) Aggregate Shoulder	2211 2221		1 DCP test/500 yd ³ (CV)			
(c) 2105	(c) Granular Borrow Select Granular Borrow	2105, 3149, & Special Provisions	Contractor is encouraged to perform tests for process control.	1 DCP test/2,000 yd ³ (CV)	None	None	02115-03 & Special Provisions
(a) 2211 (b) 2221	6. Relative Moisture (Required for Specified Density) (a) Aggregate Base (b) Aggregate Shoulder	2211, 2221, & Special Provisions	2005 Spec Book: Contractor is encouraged to perform tests 2011 Spec Book: 1/1,000 yd ³	2005 Spec Book: 1 per 1/1,000 yd ³ or 10 tests whichever is less 2011 Spec Book: none			
	(c) 2105	(c) Embankment Soil (Excavation & Borrow)	2105 & Special Provisions	2005 Spec Book: Contractor is encouraged to perform tests 2011 Spec Book: 1/10,000 yd ³			

I. Grading and Base Construction Items (cont.)

Pay Item Number	Material	Spec. No.	Minimum Contractor Quality Control Testing Rate	Minimum Agency Verification (Acceptance) Testing Rate (See Note 1)	Minimum Field Sample Size	Minimum Companion (Lab) Sample Rate & Size (See Note 2)	Form No. (See Note 4)
(a) 2211 (b) 2221	7. Moisture Content, (Dry Weight) (Required for Quality Compaction, Penetration Index Method, & Modified Penetration Method) (a) Aggregate Base (b) Aggregate Shoulder	2211, 2221, & Special Provisions	2005 Spec Book: Contractor is encouraged to perform tests 2011 Spec Book: 1/1,000 yd ³	2005 Spec Book: 1 per 1/1,000 yd ³ or 10 tests whichever is less 2011 Spec Book: none	None	None	02115-03 & 21850-02
(a) 2105 2118 2211 2221	8. Percent Crushing (a) Belt Samples	3138, 3149, & Special Provisions	One Per Day	None			02463 & 24346-02
(b) 2105 2118 2211 2221	(b) Particle Count			One Per Source (See Note 7)			
2105 2118 2206 2211 2221 2451 2502	9. Aggregate (Quality Tests)	3138, 3149, & Special Provisions	1/source (See Note 5)	None		1 per source 30 lb (See Note 3)	None

I. Grading and Base Construction Items (cont.)

General Note: Sampling and Testing Procedures are found in the Grading and Base Manual in Section 5-692.200.

Note 1: Samples are not required for 500 ton or less. Report small quantities on form 02415 or 2403.

Note 2:

- a) Laboratory samples are not required for 1,000 tons or less.
- b) Include the laboratory companion with the first field sample..
- c) Include the field sample results with the laboratory sample.
- d) Laboratories with AMRL Accreditation are not required to submit laboratory companion samples.

Note 3: Carbonate aggregate materials require 50 lbs for the lab.

Note 4: Forms are available on the Grading & Base website at: <http://www.dot.state.mn.us/materials/gradingandbase.html>

Note 5: The Contractor may use the Ignition Oven (Mn/DOT Lab. Manual Method 1853) to determine bitumen content.

Note 6: Major soil types are defined in the Triaxial Chart located in the Grading and Base Manual.

II. Bituminous Construction Items for Specification 2360 (Note #1)(All bituminous mixtures are from Certified Plants) (www.dot.state.mn.us/materialsbituminous.html)**DEFINITIONS**

SAMPLE TYPE	DESCRIPTION	SAMPLE LOCATION DETERMINED BY	SAMPLE TAKEN BY	SAMPLE TESTED BY
QC	Quality Control Testing performed by Contractor. Also known as Process Control Testing.	Contractor	Contractor	Contractor
QA	Quality Assurance Testing performed by the Agency. This test is performed on a companion sample to the Contractor's QC sample.	Contractor Contractor (mixture) Agency (density cores)	Contractor	Agency
Verification	A sample to assure compliance of the Contractor's Quality Control program. The results shall be included as part of the QA Testing Program.	Agency	Agency	Agency
Verification Companion	A companion sample to the Agency's Verification sample provided to the Contractor. The Contractor <u>is required</u> to test this sample. The results <u>shall be used</u> as part of the QC program.	Agency	Agency	Contractor
IAST	The <u>I</u> ndependent <u>A</u> ssurance <u>S</u> ampling and <u>T</u> esting assures testers are sampling and testing properly and that equipment is calibrated correctly.	Agency	Contractor or Agency	Contractor or Agency

A. Pre-Production Sampling and Testing for Specification 2360

SAMPLE SIZE: 35 kg (80 lb.) - plus #4 aggregate sample for quality testing and Percent Crushing
 15 kg (35 lb.) - minus #4 aggregate for quality testing
 35 kg (80 lb.) - RAP for Quality Testing
 5 kg (10 lb.) - RAS (Shingles) for Gradation and Quality Testing
 33 kg (75 lb.) - bituminous mixture plus 2 Gyratory specimens for volumetric testing
 35 kg (80 lb.) - bituminous mixture for TSR testing (option A)
 8 kg (18 lb.) - bituminous mixture for TSR testing plus 6 Gyratory specimens (option B)
 1 kg (2 lb.) - for mineral filler.

1. Bituminous Mix Design (QC/QA)QC Testing

REMARKS: Mix Design for Spec. 2360 is Contractor's responsibility with review by Mn/DOT.

QA Testing

For Gyratory Design, Option 1- Laboratory Mix Design: In addition to reviewing the Trial Mix data (JMF), test Contractor's two Gyratory specimens and uncompacted mixture (specimens and mixture submitted at optimum asphalt content). Also, evaluate TSR per 2360.2B5a(3). For option 2, Modified Mix Design, review Trial Mix data only.

For Gyratory Design Option 2, Modified Mix Design, review Trial Mix data only.

II. Bituminous Construction for Specification 2360 (Part A, cont.)**2. Aggregate Quality Testing (QA Only)**QA Testing

Contractor shall provide 24 hour notice of intent to sample aggregates for quality testing. Agency has the option to monitor sampling.

Contractor submits to the Bituminous Engineer or the District Materials Engineer one (1) sample of each non-asphaltic aggregate type or class per source per year. Contractor shall also submit the asphaltic aggregate material when the mixture contains RAP or RAS.

Quality testing will be performed as directed by the Bituminous Engineer or the District Materials Engineer. When aggregate qualities approach specification limits or when material variation is observed, take additional field samples.

Contractor shall provide documentation that of all RAS /TOSS (Tear Off Shingle) material is from a MPCA certified supplier.

3. Mineral Filler (QA Only)QA Testing

One (1) per shipment of 45 metric tons (50 tons) or less, unless previously inspected.

4. Additives (QA Only)QA Testing

1 L (1 qt.) of blended asphalt binder and additive. Sample first shipment of each type of material, then submit one sample per 1,000 m³ (250,000 gal.) (approximately 1,000 ton).

B. BITUMINOUS PRODUCTION for Specification 2360

SAMPLE SIZE: 15 kg (35 lb.) for Aggregate for Gradation (QC/QA)

35 kg (75 lb.) for each plus #4 Aggregate Type for Quality Testing

15 kg (35 lb.) for each minus #4 Aggregate Type for Quality Testing

35 kg (75 lb.) for each RAP material for Quality Testing

5 kg (10 lb.) RAS (Shingles) for Processed Gradation and Quality Testing

30 kg (65 lb.) for Mixture Properties (QC/QA) 3 full 6" by 12" cylinder molds for QA (Gyratory mixes)

40 kg (90 lb.) for TSR (QC/QA) 4 full 6" by 12" cylinder molds for QA

40 kg (90 lb.) for Aggregate Specific Gravity (QC/QA)

1 L (1 qt) for Asphalt Binder (QA)

2 L (½ gal) for Asphalt Emulsion (QA)

1. Plant Mix Aggregate Gradation Testing (QC/QA, Verification*)QC Testing

1 per 450 metric tons (500 tons) at start of production, for the first 1,800 metric tons (2,000 tons) of mixture produced, then

1 per 900 metric tons (1,000 tons) or portion thereof per mix blend as required by 2360. 2G6

Companion samples taken for agency.

REMARKS: See Note #2, Note #3, & Note #5.

QA Testing

Companions to QC samples set aside for 10 calendar days & tested as needed. The Agency representative observes QC testing as needed.

2. Aggregate Percent Crushing (QC/QA, Verification*)QC Testing

Testing rates as required by 2360.2G6 CAA, 2360.2G6 FAA. Two tests per day (CAA, FAA) for first two days. If CAA results exceed the specification minimum by 8% of the requirement; sample daily, test minimum one per week. If FAA results exceed the specification minimum by 5% of the requirement; sample daily, test minimum one per week.

REMARKS: See Note #2, Note #3, & Note #4

QA Testing

Companions to QC samples set-aside for 10 calendar days and tested as needed. The Agency representative observes QC testing as needed.

3. Aggregate Quality Testing (QA Only)QA Testing

When aggregate qualities approach specification limits or when material variation is observed, take additional field samples as requested by Project Engineer.

When material variation is observed in RAP or RAS take additional field samples as requested by Project Engineer.

B. Bituminous Production for Specification 2360 (cont.)

4. Asphalt Binder Content, % (QC/QA, Verification)

QC Testing

1 per 450 metric tons (500 tons) per mix blend for first 1,800 metric tons (2,000 tons) of mixture produced. Then 1 per 900 metric tons (1000 tons) or portion thereof per mix blend as required by 2360.2G6

REMARKS: See Note #5.

- | | |
|-------------------------------------|---------------------------------------|
| (a) Meter Method (Virgin only)..... | Mn/DOT Bituminous Manual |
| (b) Incinerator Oven..... | Mn/DOT Lab Manual Method 1853 |
| (c) Chemical Extraction..... | Mn/DOT Lab Manual Method 1851 or 1852 |
| (d) Spot Check (Virgin only)..... | Mn/DOT Bituminous Manual 5-693.848 |

REMARKS: The verification companion sample must use Method (b) or (c) only. When more than one Mn/DOT approved test procedure is available, the Contractor shall select one method at the beginning of the project (when material is submitted for Trial Mix Review) and use that method for the entire project. The Contractor and Engineer may agree to change test procedures during the construction of the Project.

REMARKS: See Note #2 & Note #3. If a member of a monitoring team observes the Contractor test, note and sign under remarks.

REMARKS: A computer file of the plant's control settings is required every 20 minutes for verifying the % add AC

QA Testing Companions to QC samples set aside for 10 calendar & tested as needed. The Agency representative observes QC testing as needed. The Agency will review the computer files of the plant's control settings.

5. Mixture Properties (QC/QA, Verification*)

Maximum Specific Gravity, Gyratory Bulk Specific Gravity - 2 Specimen Average, air voids, Adjusted Asphalt Film Thickness (AFT), asphalt binder content, gradation, and AC/Total AC ratio.

REMARKS: See Note #7 Asphalt Film Thickness (AFT)

QC Testing

1 per 450 metric tons (500 tons) per mix blend, at the start of production, for first 1,800 metric tons (2,000 tons) of mixture produced. Determine planned tonnage for each mixture to be produced during the production day. Divide the planned production by 1,000; round up to the next higher whole number. This number will be the number of production tests required for that mixture. Verification Companion testing from Agency split sample is required to be performed and shall be used as a QC sample once per day.

REMARKS: See Note #2, Note #3, & Note #9.

QA Testing

Companion samples to QC samples set aside for 10 calendar days and tested as needed. The agency representative shall review QC operations on a daily basis. Review shall include but is not limited to monitoring QC summary sheets and comparing allowable tolerances for verification sample/verification companion sample test results. The Agency representative shall observe either 1 QC test per week (during production) or 1 QC test per 10,000 tons, whichever results in more frequent observations.

*Verification Testing

Verification Companion testing from Agency split sample is required to be performed and shall be used as a QC sample once per day. The verification companion shall also be tested for CAA and FAA at a rate of 1 test per week, if the CAA and FAA exceed the requirements by 8% and 5% respectively, otherwise test daily.

An Agency representative will take 1 verification sample per mixture blend per day for Mn/DOT laboratory testing. A verification companion sample will be given to contractor for QC testing.

II. Bituminous Construction for Specification 2360**B. Bituminous Production for Specification 2360 (cont.)****6. Core Density and Thickness**QC Testing

Production/lot testing rate requirements.

Daily Production		Lots
Metric Ton	English (ton)	
270* – 545	(300* – 600)	1
546 – 910	(601 – 1000)	2
911 – 1455	(1001 – 1600)	3
1456 – 2359	(1601 – 2600)	4
2360 – 4173	(2601 – 4600)	5
4174+	(4601 +)	#

Add 1 lot/every 900 tons over 4601 tons (4174 metric tons)

*When mix production is less than 270 metric tons (300 tons), establish 1st lot when accumulative tonnage exceeds 270 metric tons (300 tons).

Core locations determined and marked by Agency. Companion cores are required for each Contractor density core. The Contractor shall schedule the approximate time of testing during normal project work hours so that the Agency may observe and record the saturated surface dry and immersed weight of the cores.

REMARKS: Sawing of cores into separate lifts is required. Contractor is required to have a saw capable of separating the core lifts without damaging the material. See Note #8 for Longitudinal joint density cores.

QA Testing

Core locations determined and marked by Agency. Agency representative observes all Contractor coring, measuring, sawing and testing, and takes possession of Agency cores after sawing. Agency cores shall be transported and tested at the Laboratory (Agency field or District/Division) as soon as possible to prevent damage due to improper handling or exposure to heat. A completed coring log shall be submitted to the Laboratory (Agency field or District/Division).

Remarks: See Note #6, Note #8, and Note #9

7. Aggregate Specific Gravity (QC/QA)

QC Sampling: Sampled and tested by Contractor, if requested by District Materials Engineer.

QA Testing: Companion sample to QC sample shall be submitted to the District Materials Lab and tested as needed.

8. Tensile Strength Ratio (T.S.R.) (QC/QA)QC Sampling

Sample as directed by the Engineer. If the Engineer requires the samples to be tested, both the Contractor and the Department will be required to test these samples within 72 hours after they are sampled.

QA Testing

When QC sampling is required, the companion sample to QC sample shall be submitted to the District/Division Materials Lab and tested as needed.

II. Bituminous Construction Items for Specification 2360**B. Bituminous Production for Specification 2360 (cont.)****9. BITUMINOUS MATERIALS**

Only Bituminous Materials from Certified Sources are allowed for use. The most current list of Certified Sources can at <http://www.dot.state.mn.us/products>

SAMPLE SIZE: 1 L (1 qt) for Asphalt Binder (QA)/Cutback Asphalt (QA)

2 L (½ gal) for Asphalt Emulsion (QA)

Pay Item No.	Material	Spec. No.	Quality Control (QC)	Quality Assurance (QA)	Form No.
2360	Asphalt Binder	3151.2A	QC testing is the responsibility of the bituminous material supplier. Random sampling is arranged by the Mn/DOT Chemical Laboratory.	State inspector observes contractor personnel taking sample. Sample first shipment of each grade of material at the start of a plant's production or after set-up of a portable plant. Thereafter, submit one sample per 1,000,000 liters (250,000 gal). Sample asphalt binder in clean one L (1 qt) steel container.	2413 Asphalt Sample Identification Card
2201 2355 2356 2357 2514	Asphalt Emulsion	3151.2C		Sample first shipment, then submit one sample per 200 m ³ ((50,000 gal.). Sample asphalt emulsion in clean two L (2 qt.) plastic container with wide screw top and send to Mn/DOT Chemical Lab within 7 days of sampling.	
2357 2358 2514	Cutback Asphalt	3151.2B		Cutback Asphalt should only be used in cold temperature applications with the Engineer's approval. Contact Bituminous Engineering Unit for cold temperature application guidelines. Pressure fit 1 L (1qt.) container for cutback asphalt.	

10. Moisture Content in Mixture (QC only)**QC Testing**

Sampling and testing shall be conducted by the Contractor on a daily basis unless exempted by the Engineer and tested according to the procedures in the Laboratory Manual 1855. Moisture contents above 0.3% are not allowed.

Note #1 Projects with bituminous tonnage less than or equal to 272 metric tons (300 tons) per day may be accepted on a small quantity basis at the discretion of the Engineer. Retain Form 02415 or Form 2403 in Project File.

II. Bituminous Construction for Specification 2360**B. Bituminous Production for Specification 2360 (cont.)**

Note #2 All QA test samples shall be from split samples.

If a member of the monitoring team observes the Contractor Test, note and sign under remarks.

The Project Engineer is responsible for:

- 1.) Reviewing control charts & Test summary sheets for accuracy and completeness,
- 2.) Checking sampling and testing procedures,
- 3.) Discussing QC problems with the Contractor,
- 4.) Obtaining Verification Samples,
- 5.) When additional testing is necessary, collect QA samples which have been acquired and retained by the Contractor and/or additional verification samples.

Note #3 For Mixture Quality Management, acceptance will be based on Contractor's test results as verified by Mn/DOT test results.

Note #4 Bituminous mixes composed entirely of Class A and/or Class B aggregates are not required to be tested for CAA (Coarse Aggregate Angularity).

Note #5 When the required sampling rate is one test per 500 tons, divide the bituminous mixture production planned for the day by 500, and round up to the next higher whole number; this will be the number of tests required for the day. When the required sampling rate is one test per 1000 tons, divide the bituminous mixture production planned for the day by 1000, and round up to the next higher whole number; this will be the number of tests required for the day. When the required sampling rate is one test per 2000 tons, divide the bituminous mixture production planned for the day by 2000, and round up to the next higher whole number; this will be the number of tests required for the day.

Note #6 The Department will select at least one of the two companion cores per lot to be tested for mat density. However, the Department may elect to test all companions to provide a direct verification of all individual and daily average test results. Agency representative observes all Contractor coring, sawing, measuring and testing, and takes possession of Mn/DOT cores after sawing. Agency cores shall be transported and tested at the Laboratory (Agency field or District/Division) as soon as possible to prevent damage due to improper handling or exposure to heat. A completed coring log shall be submitted to the Laboratory (Agency field or District/Division).

Note #7 Mn/DOT projects in the 2011 Construction season will require the calculated Adjusted Asphalt Film Thickness (AFT). VMA will still be calculated for informational purposes, but will not be used for acceptance criteria. The adjusted AFT shall be calculated each time a gradation test is required.

Note #8 When required, Longitudinal Joint (LJ) Density will be evaluated at random lots as determined by the engineer. Number of LJ lots for the day = number of lots calculated for mat density divided by .20 and rounding up to the next integer. Minimum of one LJ lot per day. For designated LJ lots the agency will test at least one of the mat density companion cores and at least one of the LJ companion cores.

Note #9 Random number generation and determination of random sample location shall be consistent with the Mn/DOT Bituminous Manual Section 5-693.7 Table A or Section 5 of ASTM D3665. The Engineer may approve alternate methods of random number generation.

III. Construction Items for the following Special Provisions**A. (2356) Bituminous Seal Coat, Otta Seal, and Micro Surfacing****B. (2213) Permeable Asphalt Stabilized Relief Course (PASSRC) and Permeable Asphalt Stabilized Base (PASB)****C. (2356) Ultra Thin Bonded Wearing Course (UTBWC)****D. (2357) Bituminous Tack Coat**

DEFINITIONS				
Sample Type	Description	Sample Location Determined By	Sample Taken By	Sample Tested By
	<i>Definitions from 23 CFR 637.203</i>			
QA Quality Assurance	All those planned and systematic actions necessary to provide confidence that a product or service will satisfy given requirements for quality			
QC Quality Control	All contractor/vendor operational techniques and activities that are performed or conducted to fulfill the contract requirements.	Contractor	Contractor	Contractor
Verification sampling and testing	Sampling and testing performed to validate the quality of the product.	Agency	Agency	Agency
	<i>Mn/DOT Definition</i>			
IAST	The Independent Assurance Sampling and Testing assures testers are sampling and testing properly and that equipment is calibrated correctly.	Agency	Contractor or Agency	Contractor or Agency

Should unique circumstances arise on a project which makes the quantities or rates of testing materials impractical, they may be revised prior to performing the work by contacting the Pavement Management Unit and obtaining their approval. The testing rates shown are only minimums.

III. Construction Items for Special Provisions (cont.)

A. (2356) Bituminous Seal Coat, Otta Seal, and Micro Surfacing

D. (2357) Bituminous Tack Coat (cont.)

SAMPLE SIZE: Mix Design: 150 lbs.					
Pay Item No.	Test Type	Spec. No.	Quality Control (QC)	Quality Assurance (QA)	Form No.
2356	Seal Coat Mix Design Gradation and Aggregate Qualities	2356	One per source Average gradation during production. % Shale Static Stripping Test Flakiness Index Los Angeles Rattler Aggregate design application rate. Bit. Material design application rate Loose unit mass (weight) of the aggregate Bulk specific gravity of the aggregate	Verify all QC results and review mix design.	
2356 Bit Seal Coat & Otta Seal	Seal Coat Aggregate Stockpile Production Gradation Construction	2356	Test for gradation. One per day, or one per 1360t (1500 tons), whichever is greater. If a temporary stockpile is used, test at this location. Sample for gradation. One per day. Test if required by the Engineer. All samples shall be taken from chip spreader hopper.	Test for gradation. One per day, or one per 1360t (1500 tons), whichever is greater. If a temporary stockpile is used, test at this location. Sample for gradation. One per day. Test if required by the Engineer. All samples shall be taken from chip spreader hopper.	
2356 Bit Seal Coat & Otta Seal 2357	Seal Coat Emulsion Application rate Fog Seal Emulsion Application rate		Use a certified asphalt emulsion source. Verify the application rate daily by dividing the volume used by the area covered. Use a certified asphalt emulsion source. Verify the application rate daily by dividing the volume used by the area covered	Sample first shipment, then submit one sample per 200 m ³ (50,000 gal.). Sample asphalt emulsion in plastic container with wide screw top and immediately send to Mn/DOT Chemical Lab. One sample to test fog seal for dilution rate. Sample asphalt emulsion in plastic container with wide screw top and immediately send to Mn/DOT Chemical Lab.	2413 Asphalt Sample ID Card 2413 Asphalt Sample ID Card

III. Seal Coat Construction Items for Special Provisions (cont.)**B. (2213) Permeable Asphalt Stabilized Stress Relief Course (PASSRC) and Permeable Asphalt Stabilized Base (PASB)**

Pay Item No.	Test Type	Spec. No.	Quality Control (QC)	Quality Assurance (QA)	Form No.
2213 PASSRC & PASB	Mix Design	2356 3139 3151	Submit 80 lbs of coarse and 30 lbs of fine aggregates for each JMF blend. Submit 4 qts of required binder from a certified Supplier	Verify aggregate qualities and perform a mix design.	
2213 PASSRC & PASB	Production Mix	2356	Sample 35 lbs (15 kg) of blended aggregate from the belt. Test for gradation and CAA. Sample and test one per 500 ton (450 tonne) at the start of production for the first 2000 ton (1800 tonne). Then test one per day or one per 1000 ton (907 tonne), whichever is greater.	Verify gradation and CAA, once per day.	
	Asphalt Binder	3151	Asphalt spot check (min 1 per day) Sample first load. Submit sample in 1 qt (1 L) can. QC testing is the responsibility of the Material supplier.	Inspector observes contractor taking sample.	

C. (2356) Seal Coat - Micro-surfacing, Ultra Thin Bonded Wearing Course

Pay Item No.	Test Type	Spec. No.	Quality Control (QC)	Quality Assurance (QA)	Form No.
2356 UTBWC	Mix design	2356 3139 3151	Contractor create mix design and submit to Agency for review Submit 80 lbs of coarse and 30 lbs of fine aggregates for each JMF blend	Verify all QC results and review mix design.	
2356 UTBWC	Production mix	2356	Sample 55 lbs (25 kg) of mix from truck every 300 tons (270 tonne). Test for % AC, gradation, max gravity and adj AFT	Verify % AC, gradation, max gravity and adj AFT. Min once per day	
	Asphalt Binder	3151	Sample first shipment, then submit one sample per 250,000 gal. (1,000,000 liters). Submit sample in 1 qt (1 L) can.	Inspector observes contractor taking sample.	
	Polymer Modified Emulsion Membrane	3151	Sample first shipment, then one per 50,000 gal (200,000 liters). Submit sample in ½ gal (2 L) wide screw top container.	Inspector observes contractor taking sample.	

III. Seal Coat Construction Items for Special Provisions (cont.)**C. (2356) Seal Coat - Micro-surfacing, Ultra Thin Bonded Wearing Course**

SAMPLE SIZE: Mix Design: 150 lbs.					
Pay Item No.	Test Type	Spec. No.	Quality Control (QC)	Verification	Form No.
2356 Micro Surfacing	Mix Design	2356	One per source	Verify all QC results and review mix design.	
	Gradation and Aggregate Qualities		Average gradation during production. Sand Equivalent Abrasion Resistance Soundness		
	Asphalt Emulsion	3151	Certified asphalt emulsion source Residue after Distillation Softening Point Penetration at 25C (77F) Absolute Viscosity at 60C (140F)		
	Mix Design		Wet Stripping Wet Track Abrasion Loss - one hour soak - six day soak Saturated Abrasion Compatibility Mix Time at 25C (77F) Mix Time at 37.4C (100F)	Review test results submitted in the mix design format required in the special provision.	
2356 Micro surfacing	Aggregate				
	Stockpile Production		Test for gradation. One per day, or one per 1360t (1500 tons), whichever is greater. If a temporary stockpile is used, test at this location.		
	Construction		Sample for gradation, sand equivalence and moisture content. One per 435.6 metric tons (500tons), minimum of one per day.	Test for gradation. One per 1360t (1500 tons), If a temporary stockpile is used, test at this location. Determine moisture content. One per day	

III. Seal Coat Construction Items for Special Provisions (cont.)

C. (2356) Seal Coat - Micro-surfacing, Ultra Thin Bonded Wearing Course

Pay Item No.	Test Type	Spec. No.	Quality Control (QC)	Verification	Form No.
2213 2356 Micro surfacing	Emulsion		Use a Certified asphalt emulsion source.	Sample first shipment, then submit one sample per 200 m ³ (50,000 gal.). Sample asphalt emulsion in plastic container with wide screw top and immediately send to Mn/DOT Chemical Lab.	2413 Asphalt Sample ID Card
	Quantity		Verify the quantity using equipment counter readings.		
	Fog Seal (when required)		Use a certified asphalt emulsion source.	One sample to test fog seal for dilution rate. Sample asphalt emulsion in plastic container with wide screw top and immediately send to Mn/DOT Chemical Lab.	2413 Asphalt Sample ID Card
	Application rate		Verify the application rate daily by dividing the volume used by the area covered.		

IV. Concrete Construction Items (www.dot.state.mn.us/materials/concrete.html)

The testing rates shown in this Schedule of Materials Control are minimums. All samples shall be taken in a random manner using an appropriate number generator. Take as many tests as necessary to ensure quality concrete.

If concrete quantities on the entire project total $< 100 \text{ m}^3$ (yd^3), Form 02415 or Form 2403 Inspection Report for Small Quantities may be used in lieu of the Weekly Concrete Report.

It is recommended that the Agency Plant Monitor be present during critical pours, such as superstructure or paving concrete (i.e. 3Y33, 3Y36, 3Y46, 3A21).

If any field test fails, reject the concrete or if the Producer makes adjustments to the load to meet requirements, record the adjustments on the Certificate of Compliance and the Weekly Concrete Report. Retest the load and record the adjusted test results. Make sure the next load is tested before it gets into the work.

If batching adjustments are made at the plant, test the adjusted load, before it gets into the work. Continue to test the concrete when test results are inconsistent or marginal.

The first load of concrete for any pour must have passing air content and slump results, prior to placing.

Material not meeting requirements shall not knowingly be placed in the work. If failing concrete inadvertently gets placed in the work, either the Mn/DOT Standard Specifications for Construction or the Schedule of Price Reductions for Concrete address penalties.

It is recommended that the Agency representative continually monitor the progress of all concrete pours in the field and review Certificates of Compliance. It is not a recommended practice to only perform minimum testing requirements and leave the pour.

Should circumstances arise on a project which makes the testing rate impractical, contact the Concrete Engineering Unit.

DEFINITIONS				
	Description	Sample Location Determined By	Sample Taken By	Sample Tested By
QC	Quality Control Testing performed by Contractor. Also known as Process Control Testing.	Contractor	Contractor	Contractor
QA	Quality Assurance Testing performed by the Agency. This test is performed on a companion sample to the Contractor's QC sample.	Contractor	Contractor	Agency
Verification	A sample to assure compliance of the Contractor's Quality Control program. The results shall be included as part of the QA Testing Program.	Agency	Agency	Agency
Verification Companion	A companion sample to the Agency's Verification sample provided to the Contractor. The Contractor is required to test this sample. The results shall be used as part of the QC program.	Agency	Agency	Contractor
IAST	The Independent Assurance Sampling and Testing assures testers are sampling and testing properly and that equipment is calibrated correctly.	Agency	Contractor or Agency	Contractor or Agency

Concrete Plant Batching Materials**Remarks:**

- (1) All materials must come from certified or qualified sources. All certified sources must state so on the delivery invoice.
 (2) The most current list of certified/approved sources can be found at www.dot.state.mn.us/products.

Sample Sizes:**Cementitious:** 2 kg (5 lb)**Admixture:** 0.25 L (1/2 pt) Producer obtains samples from dispensing tubes. Store samples in plastic container.**Water:** 3.5 L (1 gal) Store sample in a clean glass or plastic container.

Pay Item No.	Material	Spec. No.	Minimum Required Sampling Rate for Laboratory Testing	Form No.
2301	Portland Cement	3101	1 sample per project or 1 every 3 months, whichever is less.	24300 ID Card Cement Samples
2302	Slag	3102	The Producer obtains and stores the sample in a sealed container provided by the Agency, and includes the supplier's delivery invoice from which the sample is obtained.	
2401	Blended Cement	3103	Take additional samples as Concrete Engineer directs.	
2405	Fly Ash	3115		
2411	Admixtures (Accelerating, Retarding, Water-Reducing, Air-Entraining, etc.)	3113	For Concrete Paving: 1 sample of each shipment For Other Concrete: 1 sample per project or 1 every 3 months, whichever is less.	24308 ID Card Fly Ash Samples
2412			The Producer obtains and stores the sample in a sealed container provided by the Agency.	
2422				
2424				
2452	Water	3906	1 sample from any questionable source	2410 Sample ID Card
2461				
2506				
2511				
2514	Alkali Silica Reactivity (ASR) Testing	2301	1 per paving project per sand source Write "Project Specific ASR Testing" on 2410 Sample ID card for the first sand quality and cementitious samples submitted.	
2519				
2521				
2531				
2533				
2545				
2550				
2554				
2557				
2564				
2565				

Mn/DOT SD-15 April 15, 2011 Schedule of Materials Control
IV. Concrete Construction Items (cont.) (www.dot.state.mn.us/materials/concrete.html)

Certified Ready-Mix - Concrete Plant Production

Remarks:

- (1) Mix design is provided by Mn/DOT unless otherwise specified in the Contract.
- (2) All gradation and quality tests require companion samples. Samples taken at location identified on Contact Report located at plant.
- (3) Perform Quality testing as directed by the Concrete Engineer.

Minimum Sample Sizes:

Gradation Test:

+19 mm (3/4" Plus) 10 (25 lb.)
-19 mm (3/4" Minus) 5 kg (10 lb.)
CA-70, CA-80 2.5 kg (5 lb.)
Sand 500 g (1.1 lb.)

Moisture Test:

Coarse Aggregate 2000 g (4.4 lb.)
Fine Aggregate 500 g (1.1 lb.)

Quality Sample Size for Lab Submittal:

+19 mm (3/4" Plus) 25 kg (50 lb.)
-19 mm (3/4" Minus) 15 kg (30 lb.)
Fine Aggregate 15 kg (30 lb.)

Pay Item No.	Test Type	Spec. No.	Producer/Contractor Testing	Agency Testing	Form No.		
2302	Gradation Testing (QC/QA) (5-694.145 and 5-694.148)	2461	When over 20 m ³ (yd ³) of Agency concrete produced per day: Coarse: 1 per 100 m ³ (yd ³) Fine: 1 per 200 m ³ (yd ³)	None	21763 Concrete Aggregate Worksheet (QC/QA)		
2401		3126					
2405		3137					
2411			Passing aggregate gradations are required prior to the start of concrete production each day. Performing testing on representative material at the end of the most recent day of production is allowed.				
2412							
2422							
2452			Washing the fine aggregate gradation (QC) sample is not required when the result on the -75µm (#200) sieve of the unwashed sample is less than 1.0%,				
2461							
2506							
2511			Hold QA (QC companion) samples until they are picked up by the Agency monitor. Discard after 14 calendar days if not picked up.				
2514							
2519							
2521							
2531							
2533							
2545							
2550							
2554							
2557							
2564							
2565							

IV. Concrete Construction Items (cont.) (www.dot.state.mn.us/materials/concrete.html)

Certified Ready-Mix - Concrete Plant Production (cont.)				
Pay Item No.	Test Type	Spec. No.	Producer/Contractor Testing	Agency Testing
2302 2401 2405 2411 2412 2422 2452 2461 2506 2511 2514 2519 2521 2531 2533 2545 2550 2554 2557 2564 2565	Gradation Testing (Verification/ Verification Companion) (5-694.145 and 5-694.148)	2461 3126 3137	Test the Verification Companion sample. Complete on the day the sample was taken. Wash all fine aggregate Verification Companion samples.	Coarse and Fine: 1 per day or 1 per 1000 m ³ (yd ³) whichever results in the lowest sampling rate. - 2 Verification samples per week when Agency production is 3 or more days per week. When ≤ 20 m ³ (yd ³) of Agency concrete is produced <u>per week</u> , Verification samples are not required. Identify verification samples with a "V" on the Sample ID Card and the verification companion sample. Include verification companion results.
	Quality Testing including Coarse Aggregate Testing on -75 μ m (#200) (5-694.146)	3126 3137	Test at Contractor's Discretion	1 test each fraction per month Identify quality samples with a "Q" on the Sample ID Card and the Quality companion sample.
	Aggregate Moisture Testing (QC) (5-694.142)	2461	When over 20 m ³ (yd ³) of Agency concrete produced per day: Coarse and Fine: 1 per 200 m ³ (yd ³) or completed every 4 hours, whichever results in the highest sampling rate. - Complete the initial moisture content and adjust the batch water prior to the start of concrete production each day. - If weather conditions allow, performing moisture testing on representative material at the end of production the prior evening is allowed. In this event, the four-hour rate will commence with the first pour of the day, regardless if it is placed in Agency or private work.	2410 Sample ID Card None 2152 Concrete Batching Report

Mn/DOT SD-15 April 15, 2011
 Schedule of Materials Control
 IV. Concrete Construction Items (cont.) (www.dot.state.mn.us/materials/concrete.html)

Concrete Pavement - Concrete Plant Production				
Remarks: (1) Mix Design is Contractor's responsibility with review by Mn/DOT unless otherwise specified in the Contract. (2) When incentives apply according to 2301: a) Contractor QC Technician and Agency Plant Monitor are required to be present during the entire pour. b) A certified ready-mix plant shall be dedicated (provides concrete only to the concrete paving project). (3) All gradation samples shall be taken in the presence of the Agency, unless otherwise authorized by the Engineer. All gradation and quality tests require companion samples (4) Perform Quality testing as directed by the Concrete Engineer.				
Minimum Sample Sizes: Gradation Test: +19 mm (3/4" Plus) 10 (25 lb.) -19 mm (3/4" Minus) 5 kg (10 lb.) CA-70, CA-80 2.5 kg (5 lb.) Sand 500 g (1.1 lb.)				
Moisture Test: Coarse Aggregate 2000 g (4.4 lb.) Fine Aggregate 500 g (1.1 lb.)				
Quality Sample Size for Lab Submittal: +19 mm (3/4" Plus) 25 kg (50 lb.) -19 mm (3/4" Minus) 15 kg (30 lb.) Fine Aggregate 15 kg (30 lb.)				
Pay Item No.	Test Type	Spec. No.	Producer/Contractor Testing	Agency Testing
2301	Gradation Testing (QC/QA) (5-694.145 and 5-694.148)	3126 3137	For a concrete paving batch plant: When over 200 m ³ (250 yd ³) is produced per day: 1 per 750 m ³ (1000 yd ³) or completed 1 per 1/2 day, whichever results in the highest sampling rate. For a certified ready-mix plant: When over 20 m ³ (vd ³) is produced per day: 1 per 175 m ³ (250 yd ³) or completed every 4 hours, whichever results in the highest sampling rate.	Test the first 4 QA samples of production each time the Contractor mobilizes the plant or changes aggregate sources. 1 per day on randomly selected samples thereafter. Identify the gradation samples with "QA Gradation" on the Sample ID Card and include the JMF Number and the QC Gradation results. If Coarse Aggregate Quality Incentive/Disincentives apply: The Agency may also use the QA gradation sample for the Coarse Aggregate Quality incentive/disincentive testing. In this case, notify the Producer/Contractor to double the QC/QA gradation sample size.
				21764 Concrete Aggregate Worksheet JMF Well-graded Concrete Aggregate Worksheet

IV. Concrete Construction Items (cont.) (www.dot.state.mn.us/materials/concrete.html)

Concrete Pavement - Concrete Plant Production

Pay Item No.	Test Type	Spec. No.	Producer/Contractor Testing	Agency Testing	Form No.
2301	Coarse Aggregate Testing on -75 μ m (#200) (QC/QA) (5-694.146)	3137	Test the first 4 samples of production each time the Contractor mobilizes the plant, changes aggregate sources, or the cleanliness of the coarse aggregate is in question. 1 test per day thereafter	On the first day of production and each time the Contractor mobilizes the plant, changes aggregate sources, or the cleanliness of the coarse aggregate is in question: Test the first sample and then at least 1 of the next 3 samples. 1 test per week thereafter Test these samples at the plant.	21764 Concrete Aggregate Worksheet JMF
			For a concrete paving batch plant: If w/c incentives do not apply: 1 per 750 m ³ (1000 yd ³) or completed every 4 hours, whichever results in the highest sampling rate.	For a concrete paving batch plant: If w/c incentives apply: 1 per 750 m ³ (1000 yd ³) or completed every 4 hours, whichever results in the highest sampling rate. Take initial samples for aggregate moisture testing within the first 175 m ³ (250 yd ³).	
	Aggregate Moisture Testing (QC/Verification) (5-694.142)		For a certified ready-mix plant: If w/c incentives do not apply: 1 per 175 m ³ (250 yd ³) or completed every 4 hours, whichever results in the highest sampling rate. Complete the initial moisture content and adjust the batch water prior to the start of concrete production each day. If weather conditions allow, performing moisture testing on representative material at the end of production the prior evening is allowed.	For a certified ready-mix plant: If w/c incentives apply: 1 per 175 m ³ (250 yd ³) or completed every 4 hours, whichever results in the highest sampling rate. Take initial samples for aggregate moisture testing within the first 75 m ³ (100 yd ³). If w/c incentives apply: Use aggregate moisture results for determining the water content to calculate the w/c ratio incentive/disincentive. Do not leave samples unattended.	Concrete W/C Ratio Calculation Worksheet

Mn/DOT SD-15 April 15, 2011
 IV. Concrete Construction Items (cont.) (www.dot.state.mn.us/materials/concrete.html)

Concrete Pavement - Concrete Plant Production					
Pay Item No.	Test Type	Spec. No.	Producer/Contractor Testing	Agency Testing	Form No.
2301	Water Content Verification Testing (Microwave Oven Verification) (5-694.532)		Sample the fresh concrete at the plant.	<p>If w/c incentives apply: Microwave oven verification testing to verify the w/c ratio is completed in conjunction with Agency aggregate moisture testing.</p> <p>Do not leave samples unattended.</p> <p>For a certified ready-mix plant: Take initial sample for microwave oven verification testing within the first 75 m³ (250 yd³). At least one additional verification test should be taken if more than 750 m³ (1000 yd³) is produced in a day.</p>	Concrete W/C Ratio Calculation Worksheet
				<p>For a concrete paving batch plant: Take initial sample for microwave oven verification testing within the first 175 m³ (250 yd³). At least one additional verification test should be taken if more than 750 m³ (1000 yd³) is produced in a day.</p>	
				None	
	Unit Weight (QC) (5-694.542)		Test one load of concrete per day at the plant.	None	
	Air Content (QC) (5-694.541)	2461	Test the first load of concrete at the plant.	None	

IV. Concrete Construction Items (cont.) (www.dot.state.mn.us/materials/concrete.html)

Concrete Pavement - Concrete Plant Production				
Pay Item No.	Test Type	Spec. No.	Producer/Contractor Testing	Agency Testing
2301	Quality Testing including Coarse Aggregate Testing on -75 μ m (#200)	3126 3137	Test the -75 μ m (#200) on the Quality companion sample the day it was sampled. All other testing is at the Contractor's discretion	1 test each fraction every 17,500 m ³ (20,000 yd ³) of production. Split the Quality sample 4 ways: 1) Provide 2 quarters of the sample to the Producer/Contractor. 2) Test the -75 μ m (#200) on the quality sample at the plant the day it was sampled. 3) Submit the remaining sample to the lab for quality testing including testing on the -75 μ m (#200) sieve. Identify quality samples with a "Q" and record the QC and QA -75 μ m (#200) test results on the Sample ID Card. Identify the Quality Companion samples with a "Q" ..
				Form No. 2410 Sample ID Card

Mn/DOT SD-15 April 15, 2011
 Schedule of Materials Control
 IV. Concrete Construction Items (cont.) (www.dot.state.mn.us/materials/concrete.html)

Concrete Pavement - Concrete Plant Production					Form No.																				
Pay Item No.	Test Type	Spec. No.	Producer/Contractor Testing	Agency Testing																					
2301	Coarse Aggregate Quality Testing for Incentive/Disincentive	3137	Test at Contractor's discretion	<p>If coarse aggregate quality incentives apply: Test the Class B aggregates for % absorption and Class C aggregates for % carbonate including any other tests necessary to make those determinations.</p> <p>Sample the 2 largest fractions in accordance with the following table and 2301:</p> <table><thead><tr><th colspan="2">Coarse Aggregate Quality Incentive/Disincentive Sampling Rates</th><th rowspan="2">Samples per fraction (n)</th></tr><tr><th>Plan Concrete</th><th>m³ [cubic yards]</th></tr></thead><tbody><tr><td>2,900 – 6,250</td><td>[3,500 – 7,500]</td><td>3</td></tr><tr><td>6,251 – 8,500</td><td>[7,501 – 10,000]</td><td>5</td></tr><tr><td>8,501 – 21,000</td><td>[10,001 – 25,000]</td><td>10</td></tr><tr><td>21,001 – 42,000</td><td>[25,001 – 50,000]</td><td>15</td></tr><tr><td>42,001+ [50,001+]</td><td></td><td>20</td></tr></tbody></table> <p>Identify incentive samples on the Sample ID Card with "I/D."</p>	Coarse Aggregate Quality Incentive/Disincentive Sampling Rates		Samples per fraction (n)	Plan Concrete	m ³ [cubic yards]	2,900 – 6,250	[3,500 – 7,500]	3	6,251 – 8,500	[7,501 – 10,000]	5	8,501 – 21,000	[10,001 – 25,000]	10	21,001 – 42,000	[25,001 – 50,000]	15	42,001+ [50,001+]		20	2410 Sample ID Card Coarse Aggregate Quality Incentive/Disincentive Worksheet
Coarse Aggregate Quality Incentive/Disincentive Sampling Rates		Samples per fraction (n)																							
Plan Concrete	m ³ [cubic yards]																								
2,900 – 6,250	[3,500 – 7,500]	3																							
6,251 – 8,500	[7,501 – 10,000]	5																							
8,501 – 21,000	[10,001 – 25,000]	10																							
21,001 – 42,000	[25,001 – 50,000]	15																							
42,001+ [50,001+]		20																							

IV. Concrete Construction Items (cont.) (www.dot.state.mn.us/materials/concrete.html)**Concrete Field Materials (Refer to Metallic Materials and Metal Products for sampling requirements for concrete reinforcement.)****Sample Sizes:****Joint Materials:**

Hot Poured Elastomeric:

Silicone Joint Sealer:

5 kg (10 lb) Take samples from application wand into 1 gallon steel container
 0.5 liter (1 pt) Store sample in steel container.

Preformed Elastomeric: 2 m (6 ft)
 Preformed: 0.25 m² (2 ft²)

Curing Materials:

Burlap:

Paper and Plastic:

Membrane Compound

1 m² (yd²)
 0.25 m² (2 ft²)
 1 liter (1 qt)

Materials must be thoroughly stirred or agitated immediately prior to taking sample. Store sample in steel container and cover immediately.

Pay Item No.	Material	Spec. No.	Minimum Required Field Sampling Rate	Form No.
2301 2302 2401 2411 2514 2521 2531	Preformed	3702	Visual Inspection	2410 Sample ID Card
2301 2302 2401	Preformed Elastomeric Type	3721	1 per lot	
	Silicone Joint Sealer	3722	Only joint materials from qualified sources are allowed. The most current lists can be found at www.dot.state.mn.us/products .	
	Hot Poured Elastomeric Type	3723 3725		
2301 2302 2401 2411	Burlap	3751	Visual Inspection	
	Paper	3752	Visual Inspection - Must be white opaque	
2514 2520 2521 2531 2533	Membrane Curing Compound	3754 3754AMS 3755	Refer to the approved products list of curing compounds for <u>pre-approved</u> lots at http://www.mtrapps.dot.state.mn.us/CuringCompoundProducts/curingcompounds.aspx	
	Plastic	3756	Visual Inspection -Must be white opaque	
			A Certificate of Compliance shall be submitted to the Project Engineer from the Manufacturer certifying that the plastic complies with AASHTO M171.	

IV. Concrete Construction Items (cont.) (www.dot.state.mn.us/materials/concrete.html)**Concrete Field Testing – Bridges and General Concrete**

Pay Item No.	Test Type	Spec. No.	Agency Testing	Form No.
2401	Air Content (Verification) (5-694.541)	2461	1 per 100 m ³ (yd ³) Test first load each day per mix	2448 Weekly Concrete Report
2405			Test when admixture adjustments are made to the mix.	
2411	Slump (Verification) (5-694.531)	2461	1 per 100 m ³ (yd ³) Test first load each day per mix	
2412			Test when admixture adjustments are made to the mix.	
2422	Concrete Temperature (Verification) (5-694.550)	2461	No slump testing required for slipform placement	
2452			Record temperature each time air content, slump, or strength test specimen is performed/fabricated.	
2461	Compressive Strength (Verification) (5-694.511)	2461	1 cylinder per 100 m ³ (yd ³) 1 cylinder per day for sidewalk and curb and gutter	2409 ID Card Concrete Test Cylinder
2506			A set of 3 cylinders shall be made when control cylinders are needed. Mn/DOT standard cylinder mold size is 100 x 200 mm (4 x 8 inch). If aggregate has a maximum size greater than 31.5 mm (1-1/4 inch), use 150 x 300 mm (6 x 12 inch) molds.	
2511				
2514				
2520				

Concrete Field Testing – Cellular Concrete

Pay Item No.	Test Type	Spec. No.	Agency Testing	Form No.
2519	Compressive Strength (Verification) (5-694.511)	2461 2519	1 set of 4 cylinders per day 100 x 200 mm (4 x 8 inch) cylinders shall be filled in two equal lifts, do not rod the concrete, lightly tap the sides, cover and move to area with minimal or no vibration. Do not disturb for 24 hours.	2409 ID Card Concrete Test Cylinder

IV. Concrete Construction Items (cont.) (www.dot.state.mn.us/materials/concrete.html)

Concrete Field Testing – Concrete Pavement					
Pay Item No.	Test Type	Spec. No.	Contractor Testing	Agency Testing	Form No.
2301	Air Content Before Consolidation (QC/QA) (5-694.541)	2461	1 per 300 m ³ (300 yd ³) or 1 per hour, whichever is less Test first load each day per mix	1 air test per day	2448 Weekly Concrete Report
	Air Content After Consolidation (QC/QA) (5-694.541)	2461	Test 1 air content per ½ day of slip form paving to establish an air loss correction factor (ACF). See Special Provisions for additional information.	1 air test per day	
	Slump (QC/QA) (5-694.531)	2461	For fixed form placement: 1 per 300 m ³ (300 yd ³) and as directed by the Engineer Test first load each day per mix For slipform placement: No slump testing is required	For fixed form placement: 1 slump test per day For slipform placement: No slump testing is required	
	Concrete Temperature (QC/QA) (5-694.550)	2461	Record temperature each time air content, slump or strength test specimen is performed/fabricated by the Contractor.	Record temperature each time air content, slump or strength test specimen is performed/fabricated by the Agency.	
	Flexural Strength (QC) (5-694.521)	2301	1 beam (28-day) per day - Make additional control beams as necessary. - Control beams shall be made <u>within the last hour</u> of concrete poured each day. Fabricate beams, deliver beams to curing site, and clean beam boxes.	Supply beam boxes, cure, and test beams.	
	Concrete Pavement Texture (QC)	2301	1 per 1000 linear feet per lane of concrete pavement at locations determined by the Agency. All adjoining lanes shall be tested at the same location if paved at the same time. The Contractor supplies all materials necessary to perform the required testing.	Determine texture testing locations using random numbers.	Concrete Texture Worksheet
	Thickness (QC/Verification)	2301	The Contractor drills concrete cores at locations determined by the Agency. The Contractor probes the plastic concrete at locations determined by the Agency.	Determine probing and coring locations using random numbers. Initial pavement at core locations and re-initial the sides of specimens after coring to clearly verify their authenticity.	24327 Field Core Report Probing and Coring Report

IV. Concrete Construction Items (cont.) (www.dot.state.mn.us/materials/concrete.html)

Concrete Field Testing – Concrete Pavement				
Pay Item No.	Test Type	Spec. No.	Contractor Testing	Agency Testing
2301	Surface Smoothness	2301	Contractor provides Mn/DOT certified inertial profiler results for bumps/dips and/or Areas of Localized Roughness for the entire project as required by the Contract.	None
				Concrete Profile Summary Worksheet

Concrete Field Testing - Low Slump Concrete for Bridge Deck Overlays**Remarks:**

- (1) Mix design is provided by Mn/DOT on the back of the Form 21412 Weekly Report of "Low Slump Concrete" unless otherwise specified in the Contract.
- (2) All field gradation samples shall be taken by the Agency. All gradation and quality tests require companion samples.
- (3) Perform Quality testing as directed by the Concrete Engineer.

Minimum Sample Sizes:**Gradation Test:**

CA-70 2.5 kg (5 lb.)
Sand 500 g (1.1 lb)

Quality Sample Size for Lab Submittal:

Coarse Aggregate 25 kg (50 lb.)
Fine Aggregate 15 kg (30 lb.)

Pay Item No.	Test Type	Spec. No.	Contractor Testing	Agency Testing	Form No.
2404	Gradation and Quality Testing including Coarse Aggregate Testing on -75µm (#200) (QC/Verification) (5-694.145, 5-694.146) and 5-694.148))	3126 3137	Prior to concrete production, the Contractor shall provide the Agency with: <ul style="list-style-type: none"> Aggregate pit numbers 1 passing gradation result per fraction each time aggregate is delivered to the site. No quality test results are required. Test companion samples at Contractor's discretion.	1 per fraction prior to concrete production and each time aggregate is delivered to the site. Identify quality samples with a "Q" on the Sample ID Card and the Quality companion sample.	2410 Sample ID Card 21412 Weekly Report of "Low Slump Concrete"
	Air Content (Verification) (5-694.541)	2461	None	1 per 15 m ³ (yd ³) Test at beginning of pour each day	
	Slump (Verification) (5-694.531)	2461	None	1 per 15 m ³ (yd ³) Test at beginning of pour each day For concrete from a concrete-mobile, allow mix to hydrate 4 to 5 minutes before slump test to assure all cement is saturated.	
	Compressive Strength (Verification) (5-694.511)	2461	None	1 cylinder per 30 m ³ (yd ³)	2409 ID Card Concrete Test Cylinder

Concrete Field Testing – Concrete Pavement Repair (CPR)				
Remarks: (1) Mix design is provided by Mn/DOT unless otherwise specified in the Contract. (2) Testing rates apply to concrete that is produced on site. (Not from a certified ready-mix plant.) (3) All field gradation samples shall be taken by the Agency. All gradation and quality tests require companion samples. (4) Perform Quality testing as directed by the Concrete Engineer.				
Minimum Sample Sizes: Gradation Test: -19 mm (3/4" Minus) 5 kg (10 lb.) CA-70, CA-80 2.5 kg (5 lb.) Sand 500 g (1.1 lb.)				
Quality Sample Size for Lab Submittal: Coarse Aggregate 25 kg (50 lb.) Fine Aggregate 15 kg (30 lb.)				
Pay Item No.	Test Type	Spec. No.	Contractor Testing	Agency Testing
2302	Gradation and Quality Testing including Coarse Aggregate Testing on -75µm (#200) (QC/Verification) (5-694.145, 5-694.146) and 5-694.148)	3126 3137	Prior to concrete production, the Contractor shall provide the Agency with: <ul style="list-style-type: none"> Aggregate pit numbers 1 passing gradation result per fraction each time aggregate is delivered to the site. No quality test results are required. Test companion samples at Contractor's discretion.	1 per fraction prior to concrete production and each time aggregate is delivered to the site. Identify quality samples with a "Q" on the Sample ID Card and the Quality companion sample.
	Air Content (Verification) (5-694.541)	2461	None	1 per 15 m ³ (yd ³) Test at beginning of pour each day.
	Slump (Verification) (5-694.531)	2461	None	1 per 15 m ³ (yd ³) Test at beginning of pour each day. Allow mix to hydrate 4 to 5 minutes before slump test to assure all cement is saturated.
	Compressive Strength (Verification) (5-694.511)	2461	None	1 cylinder per 30 m ³ (yd ³)
				2409 ID Card Concrete Test Cylinder
				2448 Weekly Concrete Report

IV. Concrete Construction Items (cont.) (www.dot.state.mn.us/materials/concrete.html)**Concrete Field Testing –Dowel Bar Retrofit (DBR)****Remarks:**

- (1) Mix Design is Contractor's responsibility with review by Mn/DOT unless otherwise specified in the Contract.
- (2) Testing rates apply to concrete that is produced on site. (Not from a certified ready-mix plant.)
- (3) All field gradation samples shall be taken by the Agency. All gradation and quality tests require companion samples.
- (4) Perform Quality testing as directed by the Concrete Engineer.

Minimum Sample Sizes:**Gradation Test:**

CA-80
Sand 2.5 kg (5 lb.)
 500 g (1.1 lb)

Quality Sample Size for Lab Submittal:

Coarse Aggregate 25 kg (50 lb.)
Fine Aggregate 15 kg (30 lb.)

Pay Item No.	Test Type	Spec. No.	Contractor Testing	Agency Testing	Form No.
2302	Gradation and Quality Testing including Coarse Aggregate Testing on -75µm (#200) (QC/Verification) (5-694.145, 5-694.146) and 5-694.148)	3126 3137	Prior to concrete production, the Contractor shall provide the Agency with: <ul style="list-style-type: none"> Aggregate pit numbers 1 passing gradation result per fraction each time aggregate is delivered to the site. No quality test results are required. Test companion samples at Contractor's discretion.	1 per fraction prior to concrete production and each time aggregate is delivered to the site. Identify quality samples with a "Q" on the Sample ID Card and the Quality companion sample.	2410 Sample ID Card
	Dowel Bar Retrofit Material Compressive Strength (Verification) (5-694.511)	2301 2302	None	During the pre-production test operations: 1 set of 3 cylinders tested at 3 hours 1 set of 3 cylinders tested at 1 day Testing may need to be repeated if any problems with the dowel bar retrofit material are encountered. First day of production: 1 set of 3 cylinders tested at 3 hours 1 set of 3 cylinders tested at 1 day After the first day of production: 1 cylinder per day during production tested at rate determined by Engineer.	2409 ID Card Concrete Test Cylinder

V. Landscaping and Erosion Control Items

Pay Item No	Kind of Material	Spec. No.	Minimum Required Acceptance Testing (Field Testing Rate)	Minimum Required Sampling Rate for Laboratory Testing	Sample Size	Notes
2105 2571 2575	1. Manufactured Topsoil borrow ^a Salvaged Topsoil (stockpiled)	3877.2	None	From each source: One composite sample for the first 765 m ³ (1,000 Cu yd) or less. One composite sample for each additional 2,300 m ³ (3,000 Cu yd) or fraction thereof.	10 kg (20 lb.)	^a Test results showing meets specifications.. Testing for all topsoil for fertility send directly to University of Minnesota soils lab from project. Testing takes about four weeks after delivery of the sample to the Department Laboratory. Sampling shall be done once source is identified or existing topsoil is stockpiled.
2571 2575 2577	2. Plant Stock & Landscape Materials ^b	3861 and 2571.2A1	Field Inspection at Job Site, submit itemized report for each shipment ^c			^b Preliminary inspection will not be done at the source. Material must be in accordance with the Inspection and Contract Administration Guidelines for Mn/DOT Landscape Projects. ^c Utilize "Inspection and Contract Administration Guidelines for Mn/DOT Landscape Projects" to determine and measure minimum and maximum criteria thresholds. The following documentation must be provided: 1. A Mn/DOT Certificate of Compliance for Plant Stock, Landscape Materials, and Equipment 2. A valid copy of a nursery stock (dealer or grower) certificate registered with the MN Dept. of Agric. And/ or a current nursery certificate/license from a state or provincial Dept. of Agric. for each plant stock supplier. 3. A copy of the most recent Certificate of Nursery Inspection for each plant stock supplier. 4. Plant material shipped from out-of-state nursery vendors subject to pest quarantines must be accompanied by documentation certifying all plants shipped are free of regulated pests. 5. Bills of lading (shipping documents) for all materials delivered. 6. Invoices for all materials to be used. 7. Each bundle, bale, or individual plant must be legibly and securely labeled with the name and size of each species or variety.
2502 2573 2575 2577	3. Erosion Control Blanket ^d	3885	Visual Inspection	Random - See Footnote ^d	1 m ² (1 Sq yd)	^d Check Web site for list of approved products.. www.dot.state.mn.us/products

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V. Landscaping and Erosion Control Items (cont.)

Pay Item No	Kind of Material	Spec. No.	Minimum Required Acceptance Testing (Field Testing Rate)	Minimum Required Sampling Rate for Laboratory Testing	Sample Size	Notes
2573 2577	4. Erosion Control Netting ^e	3885	Visual Inspection	Random - See Footnote ^e	1 m ² (1 Sq yd)	^e Check Web site for list of approved products. www.dot.state.mn.us/products
2573	5. Silt Fence ^f	3886	Check Product Label. Obtain Certificate of Compliance with MARV values	For amounts 600m (2000 ft) or greater.	3 m (9 ft)	^f Samples sent 21 days prior to use. Check Approved/Qualified Products List (A/QPL) of accepted geotextiles.
2573	6. Flotation Silt Curtain ^g	3887	Visual Inspection			^g Accepted, based on manufacturers' certification of compliance. Check weight of fabric.
2573 2575	7. Erosion Stabilization Mat ^h	3885	Visual Inspection	See Footnote ^h	1 m ² (1 Sq yd)	^h Check Web site for list of approved products. www.dot.state.mn.us/products
2573	8. Filter Logs	3897	Visual Inspection	None		
2573	9. Flocculants ⁱ	3898	Visual Inspection	None		ⁱ Certificate of Compliance and MSDS to the Engineer.
2571 2575	10. Fertilizer ^j	3881	Visual Inspection			^j Bagged: Inspected on the basis of guaranteed analysis. Rate based on fertility analysis of slope dressing/topsoil. Bulk: Inspector to obtain copy of invoice of blended material stating analysis. Check the type specified.
2571 2575	11. Agricultural Lime ^k	3879	One gradation test for each 180 Metric Ton (200 ton)			^k Contractor must supply amount of ENP (Equivalent Neutralizing Power) for each shipment.
2575 2577	12. Mulch Material A. Type 3 Mulch - Certified Weed Free (Certified sources only) ^l	3882	Visual Inspection, Check if from Certified Vendor by Minnesota Crop Improvement Association. Must be tagged, grain straw only.			^l Certified mulch will be indicated by label.

Schedule of Materials Control

V. Landscaping and Erosion Control Items (cont.)

Pay Item No	Kind of Material	Spec. No.	Minimum Required Acceptance Testing (Field Testing Rate)	Minimum Required Sampling Rate for Laboratory Testing	Sample Size	Notes
2571 2575 2577	13. Mulch Material B. Type 6 Mulch – Woodchips	3882	Visual Inspection, one gradation per supplier.	Gradation 1/10,000 yd ³ per supplier.		All wood chips supplied by a supplier outside the Emerald Ash Borer quarantine area or have an Emerald Ash Borer Compliance Agreement with the MDA.
2502 2575 2577	14. Seeds A. Seeds (Certified Vendors Only) (Mixes 22-000 and 25-000 series) ^m	3876	Check for Certified Vendor tag from Minnesota Crop Improvement Association. If materials are on hand and past the twelve months, testing must be done.		0.5 L (1 pint)	^m Periodic sampling taken by Office of Environmental Services. Any moldy or insect contaminated seed must be rejected.
2502 2575 2577	14. Seeds B. Native Seed (Mixes 30-000 series) certified seed only ⁿ	3876	Check if from Certified Vendor by Minnesota Crop Improvement Association. Must be tagged. If materials are on hand and past the twelve months, testing must be done.			ⁿ Certified seed will be indicated by label on containers. Reject all moldy or insect contaminated seed. Periodic sampling taken by Office of Environmental Services.
2575	15. Sod ^o	3878	A certified tag by Minnesota Crop Improvement Association for Salt tolerant sod. Final Visual Inspection at site.			^o A Certificate of Compliance must be furnished by the producer to the Engineer for the type of sod supplied showing correct grass varieties.
2571 2575	16. Compost A. Compost Certified Source ^p	3890	Visual Inspection			^p Check Approved/Qualified Products List (A/QPL).
2571 2575	17. Compost B. Compost Non-Certified Source ^q	3890		Must be sampled - One Sample per 300 m ³ (500 Cu Yd)		^q Submit samples six weeks before use. Small quantity 75 m ³ (100 Cu Yd) or less.
2575	18. Hydraulic Soil Stabilizer ^r	3884	Slump Test for Type 8	None		^r Check Approved/Qualified Products List (A/QPL).

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Pay Item No.	Kind of Material	Spec. No.	Minimum Required Acceptance Testing (Field Testing Rate)	Minimum Required Sampling Rate for Laboratory Testing	Sample Size	Notes
2401	Asphalt Plank	3204	Visual Inspection	1 per 1,000 plank or less of each thickness in each shipment	3 - 1 m (yd) pieces samples from different planks	
2131	Calcium Chloride	3911	Visual Inspection	Liquid: 1 per 40,000 L (1 per 10,000 gal) Dry: 1 per shipment	0.5 L (1 pint) or 0.5 kg (1 lb.) in Plastic Container	
2131	Magnesium Chloride	3912	Visual Inspection	1 per 40,000 L (1 per 10,000 gal.)	0.5 L (1 pint) in Plastic Container	
2331	Hot-Pour Crack Sealant for Crack Sealing/Filling	3719 3723 3725	Visual Inspection	1 per lot. Take samples from application wand. Use caution when handling hot containers	2.26 kg (5 lb.) in a 1 gal steel container.	
2481	Waterproofing Materials Membrane Waterproofing System	3757	Visual Inspection	1 per shipment (Membrane Only)	0.1 m ² (1 Sq Ft)	Only waterproofing systems from qualified sources are allowed for use. The most current list can be found at www.dot.state.mn.us/products Membrane Waterproofing System: The manufacturer shall submit a one square foot sample of the membrane along with a letter of Certification and test results stating that the membranes meet the requirements of this specification. Other components of the waterproofing system do not need to be sampled for testing.

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VI. Chemical Items (cont.)

Pay Item No.	Kind of Material	Spec. No.	Minimum Required Acceptance Testing (Field Testing Rate)	Minimum Required Sampling Rate for Laboratory Testing	Sample Size	Notes
2481	Waterproofing Materials Three Ply System Asphalt Primer	3165	Visual Inspection	1 per shipment	0.5 L (1 pt.) in steel container	
2481	Waterproofing Materials Three Ply System Waterproofing Asphalt	3166	Visual Inspection	1 per shipment	0.5 L (1 pt.) in steel container	
2481	Waterproofing Materials Three Ply System Fabric	3201	Visual Inspection	1 per shipment	1 m ² (1 Sq yd)	
2582	Waterborne Latex Traffic Marking Paint.	3591	Visual Inspection	1 per lot	0.5 L (1 pint)	Form 02415 List batch numbers and retain Certificate of Compliance. Only traffic marking paints from Qualified Products List are allowed for use. The most current Qualified Products list can be found at www.dot.state.mn.us/products
2582	Epoxy Traffic Paint	3590	Visual Inspection	1 Part A per lot 1 Catalyst Part B per lot	0.5 L (1 pint)	Form 02415 List batch numbers and retain Certificate of Compliance. Only traffic marking paints from Qualified Products List are allowed for use. The most current Qualified Products list can be found at www.dot.state.mn.us/products
2582	Traffic Marking Paint	Special Provisions	Visual Inspection	1 Part A per lot 1 Catalyst Part B per lot	0.5 L (1 pint)	Form 02415 List batch numbers and retain Certificate of Compliance. Only traffic marking paints from Qualified Products List are allowed for use. The most current Qualified Products list can be found at www.dot.state.mn.us For traffic marking paints other than Waterborne Latex and Epoxy. See Special Provision for Qualified Products List.
2564	Non-Traffic Striping Paints	3500 Series Special Provisions	Visual Inspection		0.5 L (1 pint)	Form 02415 List batch numbers and retain Certification of Compliance. For all others, see Special Provisions. Send color sample to Chemical Laboratory for color matching.

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Pay Item No.	Kind of Material	Spec. No.	Minimum Required Acceptance Testing (Field Testing Rate)	Minimum Required Sampling Rate for Laboratory Testing	Sample Size	Notes
2478	Bridge Structural Steel Paint	3520	Visual Inspection	Certificate of Compliance with each batch/lot for each component of the paint system to the Engineer. Provide a color "Draw Down" sample to the Mn/DOT Chemical Laboratory for verification of the finish coat color		Form 02415 List batch numbers and retain Certificate of Compliance. Only paints from Approved Products List are allowed for use. The most current Approved Products List can be found at www.dot.state.mn.us/ .
	Exterior Masonry Paint	3584	Visual Inspection	1 per lot Provide a color "Draw Down" sample to the Mn/DOT Chemical Laboratory for verification of the finish coat color.	0.5 L (1 pint)	Form 02415 List batch numbers and retain Certificate of Compliance Only paints from Approved Products List are allowed for use. The most current Approved Products List can be found at www.dot.state.mn.us/
	Noise Wall Stain	Special Provisions	Visual Inspection	Certificate of Compliance for each batch/lot of paint. Provide a color "Draw Down" sample to the Mn/DOT Chemical Laboratory for verification of the finish coat color.		Form 02415 List batch numbers and retain Certificate of Compliance Only paints from Approved Products List are allowed for use. The most current Approved Products List can be found at www.dot.state.mn.us/
2582	Drop-on Glass Beads	3592	Visual Inspection	1 per lot	1 L (qt.)	Form 02415 List batch numbers and retain Certificate of Compliance Only glass beads from Qualified Products List are allowed for use. The most current Qualified Products List can be found at www.dot.state.mn.us/products
2502 2581 2582	Pavement Marking Tape	3354 3355 Special Provisions	Visual Inspection	1 clean sample of each color per lot	3 m (3 yds.)	Form 02415 List batch numbers and retain Certificate of Compliance. Only pavement marking tape from Qualified Products List are allowed for use. The most current Qualified Products List can be found at www.dot.state.mn.us/products

Pay Item No.	Kind of Material	Spec. No.	Minimum Required Acceptance Testing (Field Testing Rate)	Minimum Required Sampling Rate for Laboratory Testing	Sample Size	Notes
2540 2563 2564 2565 2582	Signs and Markers	3352	Visual Inspection	None unless material suspect		Form 02415 Only Signs and Markers from Qualified Products List are allowed for use. The most current Qualified Products List can be found at www.dot.state.mn.us/products

VII. Metallic Materials and Metal Products

Pay Item No.	Kind of Material	Spec. No.	Minimum Required Acceptance Testing (Field Testing Rate)	Minimum Required Sampling Rate for Laboratory Testing	Sample Size	Notes
2554	1. Guard Rail A. Fittings - Splicers, Bolts, etc.	3381	Visual Inspection	Bolts: 2 Post bolts and 4 splice bolts with nuts for each 1,000 units or less.		Form 02415 or 2403 To be approved before use. Materials from H&R may be pre-sampled and tested. Call the MN/DOT inspector at 218-846-3613 to see if material has been approved. For non-pre-tested, submit laboratory samples at required rate. For small quantities, lab samples are not required, but document on Form 02415 or 2403 and maintain in project file. Small Quantities: Rail Sections - 20 or less Terminals - 10 or less Post Bolts - 100 or less, Splice Bolts - 100 or less
2554	1.B.i. Non-High Tension Guard Rail Cable	3381	Visual Inspection	1 sample from each spool	1.2 m (4 ft)	Form 02415 or 2403 See VII.1.A.
2554	1. B.ii. High Tension Guard Rail Cable	Special Provisions	Visual Inspection	1 sample per 50,000 feet	1.2 m (4 ft)	
2554	1. Guard Rail C. Structural Plate Beam	3382	Visual Inspection	One sample from one edge of each 200 rail sections or one sample of each 100 terminal sections	Full depth x 0.25 m (full depth x 10")	Form 02415 or 2403 See VII.1.A.

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VII. Metallic Materials and Metal Products (cont.)

Pay Item No.	Kind of Material	Spec. No.	Minimum Required Acceptance Testing (Field Testing Rate)	Minimum Required Sampling Rate for Laboratory Testing	Sample Size	Notes
2545 2554 2564	2. Steel Sign Posts	3401	Visual Inspection & Certification from Contractor of compliance with Domestic source requirement under 1601, if applicable.	Two posts per shipment of each mass per unit length. Submit shortest full sized length of each weight, not a scrap piece.	See note	Form 02415 or 2403 Check domestic steel requirement under 1601
2554 2557	3. Posts for Traffic & Fence A. Steel fence posts, brace bars, and rails	3403 3406	Visual Inspection	One sample per 500 pieces. Submit full length for posts used in the ground (line, terminal, "C" and anchor posts), and 5' length of top rail and brace bar.		Form 02415 or 2403 Check domestic steel requirement under 1601 Special Provision. Retain Certificate of Compliance and certified mill analysis in project file. See link for certification form on right side of page, www.dot.state.mn.us/materials/lab.html
2557	3. Fence B. Components: includes cup, cap, nut, bolt, end clamp, tension band, truss rod tightener, hog ring, tie wire, tension stretcher bar, truss rod, clamp, & tension wire	3376	Visual Inspection	1 each of cup, cap, nut, bolt, end clamp, tension bands, truss rod tightener, 12 hog rings, 6 tie wires, 1 tension stretcher bar; 1 truss rod, cut to 2-foot min. with threaded section, 3 feet of tension wire.		Form 02415 or 2403 Check domestic steel requirement under 1601 Special Provision. Retain Certificate of Compliance in the project file. See link for certification form on right side of page, www.dot.state.mn.us/materials/lab.html
2557	3. Fence C. Gates	3379	Visual Inspection	No sample required. See notes.		Form 02415 or 2403 Check domestic steel requirement under 1601 Special Provision. Retain Certificate of Compliance in the project file. See link for certification form on right side of page, www.dot.state.mn.us/materials/lab.html
2557	3. Fence D. Barbed Wire	3376	Visual Inspection.	One full height sample per 50 rolls	1 m (3 ft)	Form 02415 or 2403 Check domestic steel requirement under 1601 Special Provision. Retain Certificate of Compliance in the project file. See link for cert. form on right side of page, www.dot.state.mn.us/materials/lab.html

VII. Metallic Materials and Metal Products (cont.)

Pay Item No.	Kind of Material	Spec. No.	Minimum Required Acceptance Testing (Field Testing Rate)	Minimum Required Sampling Rate for Laboratory Testing	Sample Size	Notes
2557	3. Fence E. Woven Wire Fabric	3376	Visual Inspection	One full height sample per 50 rolls	1 m (3 ft)	Form 02415 or 2403 Check domestic steel requirement under 1601 Special Provision. Retain Certificate of Compliance in the project file. See link for cert. form right side of page, www.dot.state.mn.us/materials/lab.html
2557	3. Fence F. Chain Link Fabric	3376	Visual Inspection	One full height sample for each 5,000 ft of fencing.	0.3 m (1 ft)	Form 02415 or 2403 Check domestic steel requirement under 1601 Special Provision. Retain Certificate of Compliance in the project file. See link for certification form on right side of page, www.dot.state.mn.us/materials/lab.html
2402	4. Water Pipe and other Piping Materials	3364, 3365, 3366 & Special Provisions				Form 02415 or 2403 Check domestic steel requirement under 1601 Special Provision. To be identified & tested if necessary prior to use. See Special Provisions.
2201 2301 2401 2405 2411 2412 2433 2452 2472 2514 2531 2533 2545 2564	5. Reinforcing Steel A. Bars – Uncoated	3301	Visual Check for Size and Grade Marking	No Field Sample Necessary		Form 02415 or 2403 For Uncoated bars - Retain Certificate of Compliance and Certified Mill Analysis in Project File.

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VII. Metallic Materials and Metal Products (cont.)

Pay Item No.	Kind of Material	Spec. No.	Minimum Required Acceptance Testing (Field Testing Rate)	Minimum Required Sampling Rate for Laboratory Testing	Sample Size	Notes
2201 2301 2401 2405 2411 2412 2433 2452 2472 2514 2531 2533 2545 2564	5. Reinforcing Steel B. Bars - Epoxy Coated	3301	Visual Check for Size and Grade Marking and "Inspected" tag	One sample (1 bar) of each size bar for each day's coating production	1 m (3 ft)	Form 02415 or 2403 For Epoxy-Coated bars, steel will be tagged "Inspected" when it has been sampled and tested by Mn/DOT prior to shipment, and it will be tagged "Sampled" when testing has not been completed prior to shipment. If the Epoxy-Coated bars are not tagged "Sampled" or "Inspected", submit samples with copies of the , Certificate of Compliance, and Certified Mill Analysis. Retain originals of the Certificate of Compliance and Certified Mill Analysis in the project file.
2401	5. Reinforcing Steel C. Bars Stainless Steel	Special Provisions		One sample (2 Bars) per heat per bar size	1 m (3 ft)	Submit copies of mill test reports with samples, retain originals in project file
2401 2411 2452 2472 2564	5. Reinforcing Steel D. Spirals	3305		One per shipment	1 m (3 ft)	Same as 5.B
2201 2301 2401 2411 2412 2472 2531	5. Reinforcing Steel E. Steel Fabric	3303	Visual Inspection	No Field Sample Necessary		Retain Certificate of Compliance in project file.
2201 2301 2401 2411	5. Reinforcing Steel F. Dowel Bars	3302		One Dowel Bar from each shipment	Full Size Dowel Bars	For all types of dowels – Each project shall have a Certificate of Compliance from the Manufacturer certifying that all materials used in fabrication of the dowel bars and baskets comply with all applicable specifications. The Manufacturer shall maintain all records necessary for certification by project. The Certificate of Compliance shall be submitted to the Project Engineer.

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VII. Metallic Materials and Metal Products (cont.)

Pay Item No.	Kind of Material	Spec. No.	Minimum Required Acceptance Testing (Field Testing Rate)	Minimum Required Sampling Rate for Laboratory Testing	Sample Size	Notes
2401 2405	5. Reinforcing Steel G. Prestressing or Post-Tensioning Strand	3348		One sample (2 strands) from each heat (see Notes)	1.8 m (6 ft)	Submit one copy of mill certificate and one copy of the stress-strain curve representative of the lot with the samples. For most manufacturers, a heat equals a production lot, and an individual lot, pack, or reel is a subset of a heat/production lot.
2402 2506 2565	6. Drainage and Electrical Castings	3321 2471 2565	Visual Inspection	All castings: Three tensile bars to be cast with each heat at Foundry and submitted to the lab by an approved Foundry*. See 3321.		Form 02415 or 2403 Call Maplewood Laboratory at 651-366-5540 for list of approved foundries, or see website. Inspect in the field and retain Form 02415 or 2403 in project file, showing name of foundry and quantity
2401 2402 2411 2433 2545 2554 2564 2565	7. Anchor Rods (Cast in Place) and Structural Fasteners	3385 3391	Visual Inspection and Material verification testing.	Pre-approved (see notes) or one complete anchor rod assembly including nuts and washers from each lot supplied.		Pre-approved system requires supplier to submit a sample to the Department yearly for each anchor rod or fastener type. Test results of sample must verify compliance to product specifications. Supplier shall retain copy of passing test results for one year and supply with subsequent jobs. When no previous test results are available, one complete anchor rod assembly with all required nuts and washers shall be sampled and tested from each type on the project. Prior to installation, field to obtain copy of passing test report(s).
2401 2411 2433	8. Anchorages (Drilled In)	Special Provisions	Visual Inspection	No laboratory samples required		Note: Before installation, verify that anchorages are on the qualified products list www.dot.state.mn.us/products
2402	9. Structural Steel A. For Steel Bridge – Beams, Girders, Diaphragms, etc.	2471	Structural Metals Inspection Tag and field inspection for damage/defects	None		Structural metals products will be inspected at the plant and will be shipped with a Structural Metals Inspection Tag. An inspection confirmation report will be completed by Structural Metals Inspection staff and sent to the field personnel. Only approved suppliers are allowed to supply Structural Metals products. A list of approved suppliers can be found on the Bridge Office web site: http://www.dot.state.mn.us/bridge/

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VII. Metallic Materials and Metal Products (cont.)

Pay Item No.	Kind of Material	Spec. No.	Minimum Required Acceptance Testing (Field Testing Rate)	Minimum Required Sampling Rate for Laboratory Testing	Sample Size	Notes
2402 2405	9. Structural Steel B. For Concrete Girders- Diaphragms and sole plates	2471	Structural Metals Inspection Tag and field inspection for damage/defects	None		Structural metals products will be inspected at the plant and will be shipped with a Structural Metals Inspection Tag. An inspection confirmation report will be completed by Structural Metals Inspection staff and sent to the field personnel. Only approved suppliers are allowed to supply Structural Metals products. A list of approved suppliers can be found on the Bridge Office web site: http://www.dot.state.mn.us/bridge/
2402	9. Structural Steel C.. Expansion joints	2471	Structural Metals Inspection Tag and field inspection for damage/defects	None		Structural metals products will be inspected at the plant and will be shipped with a Structural Metals Inspection Tag. An inspection confirmation report will be completed by Structural Metals Inspection staff and sent to the field personnel. Only approved suppliers are allowed to supply Structural Metals products. A list of approved suppliers can be found on the Bridge Office web site: http://www.dot.state.mn.us/bridge/
2402	9. Structural Steel D. Steel Bearings	2471	Structural Metals Inspection Tag and field inspection for damage/defects	None		Structural metals products will be inspected at the plant and will be shipped with a Structural Metals Inspection Tag. An inspection confirmation report will be completed by Structural Metals Inspection staff and sent to the field personnel. Only approved suppliers are allowed to supply Structural Metals products. A list of approved suppliers can be found on the Bridge Office web site: http://www.dot.state.mn.us/bridge/
2402	9. Structural Steel E. Railing-Structural tube and ornamental	2471	Structural Metals Inspection Tag and field inspection for damage/defects	None		Structural metals products will be inspected at the plant and will be shipped with a Structural Metals Inspection Tag. An inspection confirmation report will be completed by Structural Metals Inspection staff and sent to the field personnel. Only approved suppliers are allowed to supply Structural Metals products. A list of approved suppliers can be found on the Bridge Office web site: http://www.dot.state.mn.us/bridge/

VII. Metallic Materials and Metal Products (cont.)

Pay Item No.	Kind of Material	Spec. No.	Minimum Required Acceptance Testing (Field Testing Rate)	Minimum Required Sampling Rate for Laboratory Testing	Sample Size	Notes
2402	9. Structural Steel F. Drainage Systems	2471	Structural Metals Inspection Tag and field inspection for damage/defects	None		Structural metals products will be inspected at the plant and will be shipped with a Structural Metals Inspection Tag. An inspection confirmation report will be completed by Structural Metals Inspection staff and sent to the field personnel. Only approved suppliers are allowed to supply Structural Metals products. A list of approved suppliers can be found on the Bridge Office web site: http://www.dot.state.mn.us/bridge/
2402	9. Structural Steel G. Protection Angles	2471	Structural Metals Inspection Tag and field inspection for damage/defects	None		Structural metals products will be inspected at the plant and will be shipped with a Structural Metals Inspection Tag. An inspection confirmation report will be completed by Structural Metals Inspection staff and sent to the field personnel. Only approved suppliers are allowed to supply Structural Metals products. A list of approved suppliers can be found on the Bridge Office web site: http://www.dot.state.mn.us/bridge/
2564	10. Overhead Sign structures	2564 2471	Structural Metals Inspection Tag and field inspection for damage/defects	None		Structural metals products will be inspected at the plant and will be shipped with a Structural Metals Inspection Tag. An inspection confirmation report will be completed by Structural Metals Inspection staff and sent to the field personnel. Only approved suppliers are allowed to supply Structural Metals products. A list of approved suppliers can be found on the Bridge Office web site: http://www.dot.state.mn.us/bridge/

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VII. Metallic Materials and Metal Products (cont.)

Pay Item No.	Kind of Material	Spec. No.	Minimum Required Acceptance Testing (Field Testing Rate)	Minimum Required Sampling Rate for Laboratory Testing	Sample Size	Notes
2545	11. High Mast Lighting Structures	2545 2471	Structural Metals Inspection Tag and field inspection for damage/defects	None		Structural metals products will be inspected at the plant and will be shipped with a Structural Metals Inspection Tag . An inspection confirmation report will be completed by Structural Metals Inspection staff and sent to the field personnel. Only approved suppliers are allowed to supply Structural Metals products. A list of approved suppliers can be found on the Bridge Office web site: http://www.dot.state.mn.us/bridge/
2565	12. Monotube Signal Structures	2565 2471	Structural Metals Inspection Tag and field inspection for damage/defects	None		Structural metals products will be inspected at the plant and will be shipped with a Structural Metals Inspection Tag . An inspection confirmation report will be completed by Structural Metals Inspection staff and sent to the field personnel. Only approved suppliers are allowed to supply Structural Metals products. A list of approved suppliers can be found on the Bridge Office web site: http://www.dot.state.mn.us/bridge/

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VIII. Miscellaneous Materials

Pay Item No.	Kind of Material	Spec. No.	Minimum Required Acceptance Testing (Field Testing Rate)	Minimum Required Sampling Rate for Laboratory Testing	Sample Size	Notes
2403 2422 2452 2521 2540 2545 2554 2557 2564	1. Timber, Lumber Piling & Posts	3412 to 3471 & 3491	Visual Inspection			Form 02415 or 2403 Untreated materials shall be inspected in the field and the results reported on Form 02415 or 2403. Treated materials shall be Certified on the Invoice or Shipping Ticket. Material is inspected and stamped by an Independent Agency as per Specification 3491. Contact Laboratory for additional information.
2402 2405 2557 Many	2. Miscellaneous pieces and Hardware (Galvanized)	3392 3394		3 samples of each item per shipment. Sample critical items only. (Critical items are load bearing, structurally necessary items.)	Three of each type.	Form 02415 or 2403 Will carry "Inspected" tag if sampled and tested prior to shipment. No sample necessary if "Inspected".
2504	3. Insulation Board	3760	Visual Inspection	None		Form 02415 or 2403
2402	4. Elastomeric Bearing Pads	3741 and Special Provisions	Check dimensions Check repair of tested pad	One sample, with one or more internal plates annually from each manufacturer.	Full size pad	Submit copy of Certificate of Compliance with pad. Do not use any pads that are not certified.

IX. Geosynthetics, Pipe, Tile, and Precast/Prestressed Concrete

Pay Item No.	Kind of Material	Spec. No.	Minimum Required Acceptance Testing (Field Testing Rate)	Minimum Required Sampling Rate for Laboratory Testing	Sample Size	Notes
2402 2422 2501 2503 2506	1. Corrugated Metal Products A. Culvert Pipe Underdrains Erosion control Structures	3225 thru 3229, 3351 and 3399	Visual Inspection: Check for good construction, workmanship, finish requirements and shipping			Form 02415 or 2403 Make certain pipe is Certified on Invoice, retain certificate of compliance and certified mill analysis in project file
2501	1. Corrugated Metal Products B. Structural Plate	3231	Visual Inspection: Invoice shall include notation that material described is in accordance with fabricator's Certificate and Guarantee			Same as 1.A

IX. Geosynthetics, Pipe, Tile, and Precast/Prestressed Concrete (Cont.)

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Pay Item No.	Kind of Material	Spec. No.	Minimum Required Acceptance Testing (Field Testing Rate)	Minimum Required Sampling Rate for Laboratory Testing	Sample Size	Notes
2501	1. Corrugated Metal Products C. Aluminum Structural Plate	3233				Retain certificate of compliance and certified mill analysis in project file
2503 2506	2. Clay Pipe	3251	No samples required for less than 100 pieces	1 sample per 200 pieces of each size.	Full Size Pipe	Form 02415 or 2403
2501 2503 2506	3. Concrete Pipe A. Reinforced Pipe and Arches Precast Cattle Pass Units Sectional Manhole Units	3236	Field Inspection: Check for damage and defects. Check dimensions as required. Check for producer's "Certified" stamp and signature on the certification document.	1 "companion" cylinder per month per plant during production, or cylinder testing machine, whichever is greater. Call Precast Inspection Engineer at 651-366-5540 for additional information.		Form 02415 or 2403 For Concrete Pipe Both A & B: Product will be certified by producer, only spot checks are done by plant inspector. Make certain the invoice or certification document is signed and the product has the required markings. Maintain Form 2403 or 02415 in project records, showing source of materials and type and quantity used
2503 2506	3. Concrete Pipe B. Non-Reinforced Concrete Pipe	3253	Field Inspection: Check for damage and defects. Check dimensions as required. Check for producer's "Certified" stamp and signature on the certification document.		Full Size Pipe	See 3.A
2501 2503 2506	3. Concrete Pipe Fine Aggregate	3126		1 quality test per month during production for A and B above.	10 kg. (25 lb.)	
2501 2503 2506	3. Concrete Pipe Coarse Aggregate	3137		1 quality test per month during production for A and B above.	10 kg. (25 lb.)	

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 IX. Geosynthetics, Pipe, Tile, and Precast/Prestressed Concrete (Cont.)

Pay Item No.	Kind of Material	Spec. No.	Minimum Required Acceptance Testing (Field Testing Rate)	Minimum Required Sampling Rate for Laboratory Testing	Sample Size	Notes
2412	4. Precast/Prestressed Concrete Structures	3238	1 Air test per day (1st load), 2 cylinders per pour for positive slump concrete (1 for handling, 1 for shipping).	1 "companion" cylinder per month per plant during production, or cylinder testing machine, whichever is greater. Call Precast Inspection Engineer at 651-366-5540 for additional information.		Precast/prestressed Concrete Structure (beams, posts, etc.) will be inspected and stamped at plant. Field personnel are responsible for checking for plant inspector's stamp, for shipping/handling damage or defects, and dimensions. An inspection report will be completed by plant personnel and sent to the field personnel.
	A. Reinforced Precast Box Culvert					
	Fine Aggregate	3126		1 quality test per month during production.	10 kg. (25 lb.)	
2405	Coarse Aggregate	3137		1 quality test per month during production.	10 kg. (25 lb.)	
	4. Precast/Prestressed Concrete Structures	2405	1 air test per day (1st load), 2 cylinders per pour for positive slump concrete (1 for handling, 1 for shipping).	1 "companion" cylinder per month per plant during production, or cylinder testing machine, whichever is greater. Call Precast Inspection Engineer at 651-366-5540 for additional information.		Precast/prestressed Concrete Structure (beams, posts, etc.) will be inspected and stamped at plant. Field personnel are responsible for checking for plant inspector's stamp, for shipping/handling damage or defects, and dimensions. An inspection report will be completed by plant personnel and sent to the field personnel.
	B. Precast/Prestressed Concrete Structure (beams, posts, etc.).					
	Fine Aggregate	3126	Gradation: 1 per 150 m ³ (200 Cu. yd.) or fraction thereof. 1 per day of production or 3 per week, whichever is less.	1 gradation and 1 quality test per month during production from a split sample. Include producer's gradation results on sample card.	10 kg (25 lb.)	
	Coarse Aggregate	3137	Gradation: 1 per 75 m ³ (100 Cu yd) or fraction thereof. 1 per day of production or 3 per week, whichever is less.	1 gradation and 1 quality test per month during production from a split sample. Include producer's gradation results on sample card.	10 kg (25 lb.)	

IX. Geosynthetics, Pipe, Tile, and Precast/Prestressed Concrete (Cont.)

Pay Item No.	Kind of Material	Spec. No.	Minimum Required Acceptance Testing (Field Testing Rate)	Minimum Required Sampling Rate for Laboratory Testing	Sample Size	Notes
2506	5. Manholes and Catch Basins (Construction)	2506 3622	Field Inspection: Check for damage and defects. Check dimensions as required. Check for Producer's "Certified" stamp and signature on the certification document.			Form 02415 or 2403 Product will be certified by producer or inspected, tested and stamped at source. Only spot checks are done by plant inspector. Make certain the invoice or certification document is signed and the product has the required markings. Maintain Form 2403 or 02415 in project records, showing source of materials and type and quantity used (bricks, blocks, precast, or combination).
2502	6. Drain Tile (Clay or Concrete)	3276	Visual Inspection	2 samples of each size from each source		
2502 2503	7. Thermoplastic (TP) Pipe ABS and PVC	3245	Obtain Certificate of compliance. Check for approved marking printed on pipe. Field Inspect for damage or defects.			Form 02415 or 2403 See Spec. 3245 for specific AASHTO or ASTM Pipe types are approved under this specification. If perforated, holes should be 5mm - 10 mm (3/16 - 3/8 inch) diameter, two rows for 4", and four rows for 6" diameter; approximately 75 mm (3 inches) on center.
2502	8. Corrugated Polyethylene Pipe - Single wall for edge drains, etc.	3278	Check for markings (AASHTO M 252) Certificate of Compliance. Field Inspect for damage or defects.	No Laboratory tests required		Form 02415 or 2403
2503	9. Sewer Joint Sealing Compound	3724		One per shipment	0.5 liter (1 pt.)	
2412 2501 2503	10. Preformed Plastic Sealer for Pipe	3726 Type b		One from each source	0.3 m (1 ft)	
2412 2501 2503	11. Bituminous Mastic Joint Sealer for Pipe	3728	Visual Inspection	Sample, if questionable		

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IX. Geosynthetics, Pipe, Tile, and Precast/Prestressed Concrete (Cont.)

Pay Item No.	Kind of Material	Spec. No.	Minimum Required Acceptance Testing (Field Testing Rate)	Minimum Required Sampling Rate for Laboratory Testing	Sample Size	Notes
2105	12. EPS Geofoam	Special Provisions	Visual Inspection Check for yellow aged material, uniformity and dimensions. Weigh 1'x1'x1' cut coupon to verify density every 200 m ³ (250 yd ³)			Form 02415 or 2403
2501 2503	13. Corrugated Polyethylene Pipe – Dual Wall, 12" – 48"	3247				For Specification 3247, Corrugated Polyethylene Pipe (HDPE) manufacturing facilities are required to be reviewed yearly and in compliance with AASHTO's National Transportation Product Evaluation Program (NTPEP) for producers of AASHTO M294 HDPE pipe. To determine if a pipe manufacturing plant is qualified, click on the following link for M294 pipe. http://archive.data.ntpep.org/nap/statusReport_PlasticPipe.aspx If a plant has a compliant NTPEP audit for AASHTO M294 pipe at the time the pipe is manufactured, then the plant has met requirements. Note that a previous year's audit shall govern until NTPEP issues the next year's audit. A Certificate of Compliance shall be provided in accordance with Specification 1603.

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IX. Geosynthetics, Pipe, Tile, and Precast/Prestressed Concrete (Cont.)

Pay Item No.	Kind of Material	Spec. No.	Minimum Required Acceptance Testing (Field Testing Rate)	Minimum Required Sampling Rate for Laboratory Testing	Sample Size	Notes
2105 2411 2412 2501 2502 2511 2512	14. Geotextile Fabric and Geogrid Reinforcement	3733 and Special Provisions	Inspect for damage and uniformity of texture. Rolls of both geotextile and geotextile wrapped PE Tubing must be wrapped in UV protective plastic. (Usually Black). Obtain Certificate of Compliance	<p>(a) 1 per project for pipe wrap or trench lining for Permeable base designs.</p> <p>(b) 1 per 50,000 yd² (40,000 m²) or fraction thereof of each type fabric or geogrid for all other uses.</p> <p>(c) Sewn seam, if required, 1 per project minimum, additional as appropriate.</p> <p>Small Quantity Acceptance</p> <ul style="list-style-type: none"> For fabric totals less than 200 yd² (170 m²) No sampling required Use Inspection Report for Small Quantities (Form 2403). Check: <ul style="list-style-type: none"> Certificate of Compliance Identifying label on product Geotextile Small Quantity Acceptance List at http://www.dot.state.mn.us/materials/aggregatedocs/gtxlist.pdf 	<p>(a) 10 Lin. Ft. (3 m)</p> <p>(b) 4 yd² (3 m²)*</p> <p>(c) 10 Lin. Ft. (3 m)**</p>	<p>Certificate of Compliance shall state material identification (e.g. Propex 2002, Miragrid 8XT), and minimum average roll values (MARV) for all specified geotextile properties. MARV values must meet the Specification 3733 Types 1 through 7 requirements for the specific application. Submit copy of Certificate with material samples sent to the Materials Laboratory.</p> <p>Submit additional sample(s), if the manufacturer or model of geotextile or geogrid used changes during construction.</p> <p>Sampling shall be by random selection and no more than one sample shall be taken from an individual roll. For type 6 applications (including geogrids), submit pages of Special Provisions that list required material properties. (Type 6 requirements are job specific.) For Modular Block Walls or Reinforced Soil Slopes, submit page(s) of shop drawings that reference geogrid/geotextile to be used (product name) and/or required properties.</p> <p>* Do not sample first full turn of rolled product.</p> <p>** Seam sample to include approximately 3 ft (1 m) of geosynthetic material on each side of seam (in direction perpendicular to seam).</p>

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X. Brick, Stone, and Masonry Units

Pay Item No.	Kind of Material	Spec. No.	Minimum Required Acceptance Testing (Field Testing Rate)	Minimum Required Sampling Rate for Laboratory Testing	Sample Size	Notes
2506	1. Brick A. Sewer (clay) and Building	3612 to 3615	Visual Inspection	One sample per 50,000 brick or fraction thereof	6 whole bricks	
2506	1. Brick B. Sewer (Concrete)*	3616	Visual Inspection	One sample per shipment.	6 whole bricks	* Air entrainment required. Obtain air content statement from supplier.
2506	2. Concrete Masonry Units A. For Sewer Construction	3621	Visual Inspection	One sample per shipment	6 whole units	Air entrainment required. Obtain air content statement from supplier.
2411	2. Concrete Masonry Units B. For Modular Block Retaining Walls	Special Provisions	Visual Inspection Check for cracks and broken corners	One sample per 10,000 units or fraction thereof, with a minimum of one sample per product (block) type per contract.*	5 whole units	All lots of block upon delivery shall have Manufacturer or Independent laboratory test results to verify passing both compression and freeze-thaw requirements. * Wall units and cap units are considered separate block types.
2422	3. Reinforced Concrete Cribbing	3661	Concrete control tests Air Tests Visual Inspection if previously tested	One cylinder per 100 units, but not less than 5 cylinders for a given contract. Other materials as required herein.	150 x 300mm (6 x 12 in) Cylinders	Form 02415 or 2403 Will be stamped when inspected prior to shipment.
2511 2512 2577	4. Stone for Masonry or Rip-Rap	3601 and Special Provisions	Visual Inspection Submit Form 02415 unless special testing is specified			Form 02415 or 2403 Each source shall be approved by Project Engineer or Supervisor for quality, prior to use. For questions on quality, contact District Materials or Geology Unit.

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Pay Item No.	Kind of Material	Spec. No.	Minimum Required Acceptance Testing (Field Testing Rate)	Minimum Required Sampling Rate for Laboratory Testing	Sample Size	Notes
2545	1. Lighting Standards (Aluminum or Steel)	3811	Visual Inspection			The Fabricator shall submit "Certificate of Compliance", on a per project basis, to the Project Engineer..
2545 2550 2565	2. Hand Holes (Precast, PVC, and LLDPE)	2545 2550 2565				Form 02415 or 2403 Traffic signals and street lighting projects require handholes and frames and covers to be listed on the Mn/DOT Approved/Qualified Products List (A/QPL) for signal. For cast iron frame and cover: see VII.6, Drainage Castings
2545 2565	3. Foundation	2545	Slump as needed	1 cylinder per 20 m ³ (25 Cu. yd.)		Rebar is required in concrete foundations as specified in the Contract documents for all traffic signal and street lighting projects.
2402 2545 2565	4. Conduit and Fittings A. Metallic	3801 3802	Visual Inspection	None		Form 02415 or 2403 Conduit shall be labeled as being listed by a National Recognized Testing Laboratory (NRTL). Retain Form 02415 or 2403 in Project File
2545 2565	4. Conduit and Fittings B. Non-Metallic (Rigid and HDPE)	3803 Special Provisions	Visual Inspection			Form 02415 or 2403 Conduit shall be labeled as being listed by a National Recognized Testing Laboratory (NRTL). Retain Form 02415 or 2403 in Project File. For traffic signal and street lighting projects, specific requirements are contained in the Special Provisions for each project.
2545 2565	5a. Anchor bolts (cast in place)	2545 2565				See section VII, 7.
2545	5b. Anchorages (Drilled In)	2545				See section VII, 8.

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XI. Electrical and Signal Equipment Items (cont.)

Pay Item No.	Kind of Material	Spec. No.	Minimum Required Acceptance Testing (Field Testing Rate)	Minimum Required Sampling Rate for Laboratory Testing	Sample Size	Notes
2545 2565	6. Miscellaneous Hardware	2545 2565	Visual Inspection	Sample critical items only. One of each item per shipment. (Critical items are load bearing, structurally necessary items.)		Will carry "Inspected tag if sampled and tested prior to shipment. No sample necessary if "Inspected". Do not use if not tested. Field sample at sampling rate for laboratory testing. For traffic signal and street light lighting projects, various miscellaneous hardware is required to be listed on the Mn/DOT Signals and Lighting Approved/Qualified Products Lists (A/QPL). The Contract documents indicate which items must be on the Signals and/or Lighting APL.
2545 2550 2565	7. Cable and Conductors A. Power Conductors Loop Detector Conductors (No Tubing)	3815.2B1 3815.2B2(a)	Visual Inspection	None		Form 02415 or 2403 Make certain the conductors are the type specified. Submit Field Inspection report showing type and quantities used. Shall be labeled as being listed by a National Recognized Testing Laboratory (NRTL) and type where applicable.
2545 2550 2565	7. Cable and Conductors B. Electrical Cables and Single Conductors with Jacket	3815.2B2(b) 3815.2B3 3815.2B5 3815.2C1 3815.2C3 3815.2C4 3815.2C5 3815.2C6 3815.2C7 3815.2C8 3815.2C14 Special Provisions	Visual Inspection	1 sample per size per lot	1.5m (5 ft)	Form 02415 or 2403 Usually inspected at the distributor. Documentation showing project number, reel number(s), & Mn/DOT test number(s) will be included with each project shipment. If such documentation is not received from Contractor, submit sample for testing along with material certification from manufacturer. Do not use if not tested. Pre-inspected materials will not be tagged; an inspection report will be sent by the Mn/DOT inspector for each shipment. Project inspectors should verify that the shipping documents agree with this inspection report. Call Steve Grover at 651-366-5540 or Cindy Schellack at 651-366-5543 with questions. For traffic signal and street lighting projects, the Special Provisions for each project contain electrical cable and conductor specifications.
2545 2550 2565	7. Cable and Conductors C. Fiber Optic Cables	3815.2C13	Visual Inspection - verify make and model number as shown in Special Provisions	None		Form 02415 or 2403 Fiber optic cables shall be listed on the Mn/DOT Approved/Qualified Products List (A/QPL) for Traffic Management Systems/ITS.

Pay Item No.	Kind of Material	Spec. No.	Minimum Required Acceptance Testing (Field Testing Rate)	Minimum Required Sampling Rate for Laboratory Testing	Sample Size	Notes
2545 2565	8. Ground Rods	2545 2565	Visual Inspection	None.		Form 02415 or 2403 Retain Form 02415 or 2403 in project file. Shall be labeled as being listed by a National Recognized Testing Laboratory (NRTL).
2545	9. Luminaires and Lamps	3810				Form 02415 or 2403 Traffic signal and street lighting projects require luminaires and lamps to be listed on the Mn/DOT Approved/Qualified Products List (A/QPL) for Lighting. The conductors shall be labeled as being listed by a National Recognized Testing Laboratory (NRTL) and type, where applicable.
2545	10. Electrical Systems					Electrical Systems are to be reported as a "System" using the Lighting, Signal, and Traffic Recorder Inspection Report. To be certified by the Project Engineer.
2565	11. Traffic Signal Systems	2565				Traffic Signal Systems are to be reported as a "System" using the Lighting, Signal, and Traffic Recorder Inspection Report. To be certified by the Project Engineer.

(2360) PLANT MIXED ASPHALT PAVEMENT

March 5, 2012

2360.1 DESCRIPTION

This work consists of constructing plant mixed asphalt pavement on a prepared subgrade.

Plant mixed asphalt pavement designed according to a gyratory mix design method for use as a pavement surface.

A Mixture Designations

The Department will designate the mixture for asphalt mixtures in accordance with the following:

- (1) The first two letters indicate the mixture design type:
 - (1.1) SP = Gyratory Mixture Design.
- (2) The third and fourth letters indicate the course:
 - (2.1) WE = Wearing and shoulder wearing course, and
 - (2.2) NW = Non-wearing Course.
- (3) The fifth letter indicates the maximum aggregate size:
 - (3.1) A = ½ in [12.5mm], SP 9.5,
 - (3.2) B = ¾ in [19.0mm], SP 12.5,
 - (3.3) C = 1 in [25.0mm], SP 19.0, and
 - (3.4) D = ¾ in [9.5mm], SP 4.75.
- (4) The sixth digit indicates the Traffic Level (ESAL's $\times 10^6$) in accordance with Table 2360-1, "Traffic Levels."

Table 2360-1 Traffic Levels	
Traffic Level	20 Year Design ESALs
2 *	< 1
3	1 – < 3
4	3 – < 10
5	10 – \leq 30
NOTE: The requirements for gyratory mixtures in this specification are based on the 20 year design traffic level of the project, expressed in Equivalent Single Axle Loads (ESAL's) 1×10^6 ESALs	
* AADT < 2,300	
AADT > 2,300 to < 6,000	

- (5) The last two digits indicate the air void requirement:
 - (5.1) 40 = 4.0 percent for wear mixtures, and
 - (5.2) 30 = 3.0 percent for non-wear and shoulder.
- (6) The letter at the end of the mixture designation identifies the asphalt binder grade in accordance with Table 2360-2, "Asphalt Grades."

Table 2360-2 Asphalt Grades	
Letter	Grade
A	PG 52 – 34
B	PG 58 – 28
C	PG 58 – 34
E	PG 64 – 28
F	PG 64 – 34
H	PG 70 – 28
I	PG 70 – 34
L	PG 64 – 22
M	PG 49 – 34

Ex: Gyratory Mixture Designation -- SPWEB540E (Design Type, Lift, Aggr. Size, Traffic Level, Voids, Binder)

2360.2 MATERIALS

A Aggregate

Use aggregate materials in accordance with 3139.2.

B Asphalt Binder Material.....3151

See Table 2360-7 for Maximum allowable RAP percentages when using PG 58-34, PG 64-34, and PG 70-34. The Contractor can elect to use a blending chart to verify compliance with the specified binder grade for RAP > 20%. The Department may take production samples to ensure the asphalt binder material meets the requirements. The blending chart is on the Bituminous Office Website.

C Additives

The Department defines additives as material added to an asphalt mixture or material that does not have a specific pay item. Notify the Engineer in advance of using any WMA additives or processes.

Do not incorporate additives into the mixture unless approved by the Engineer. Add anti-foaming agents to asphalt cement at the dosage rate recommended by the manufacturer. The Contractor may add mineral filler in quantities no greater than 5 percent of the total aggregate weight. The Contractor may add hydrated lime in quantities no greater than 2 percent of the total aggregate weight. Do not add a combination of mineral filler and hydrated lime that exceeds 5 percent of the total aggregate weight. Use methods for adding additives as approved by the Engineer.

C.1 Mineral Filler AASHTO M 17

C.1.a Mineral Filler – Hydrated Lime

Provide hydrated lime for asphalt mixtures with no greater than 8 percent unhydrated oxides (as received basis) and meeting the requirements of AASHTO M 216. Use a method to introduce and mix hydrated lime and aggregate as approved by the Engineer before beginning mixture production.

C.2 Liquid Anti-Stripping Additive (Contractor Added)

If adding a liquid anti-strip additive to the asphalt binder, complete blending before mixing the asphalt binder with the aggregate. Only use liquid anti-strip additives that ensure the asphalt binder meets the Performance Grade (PG) requirements in 3151. The Contractor may use asphalt binder with liquid anti-strip added at the refinery or the Contractor may add liquid anti-strip at the plant site. If using asphalt binder with liquid anti-strip added at the refinery, ensure the supplier tests the binder and additive blend to confirm compliance with

the AASHTO M 320. If an anti-strip agent is added at the plant, the plant mixed asphalt producer is considered a supplier and the binder must conform to the requirements of 3151. Do not pave until the asphalt binder and additive blend testing results meet the criteria in 2360.2.B, “Asphalt Binder Material.”

C.2.a Mixture Requirements at Design

Design the mixture with the same asphalt binder supplied to the plant site using mixture option 1, “Laboratory Mixture Design” or mixture option 2, “Modified Mixture Design.”

Provide documentation with either design option and include the amount of anti-strip needed to meet the minimum tensile strength requirements. Verify that the binder with the anti-strip meets the PG binder requirements for the mixture.

C.2.b Contractor Production Testing Requirements

Sample and test the asphalt binder and anti-strip blend daily. The Contractor may test the blend by viscosity, penetration, or dynamic shear rheometer (DSR) of the blend. If the contract requires the use of a polymer modified asphalt binder in the mixture, use the DSR as the daily QC test.

Send the Engineer and MnDOT Chemical Laboratory Director a weekly QC report summarizing the results of the daily testing.

Perform at least one test bi-weekly per project to ensure the binder and anti-strip blend meets the requirements of AASHTO M 320. Send the test results to the Engineer and MnDOT Chemical Laboratory Director.

Provide asphalt binder and anti-strip blend field verification samples in accordance with 2360.2.G.7, “Production Test.”

C.2.c Liquid Anti-Strip Additive Metering System

Include a liquid anti-strip flow meter and an anti-strip pump with the metering system. Connect the flow meter to the liquid anti-strip supply to measure and display only the anti-strip being fed to the asphalt binder.

Position the meter readout so that the inspector can easily read it.

Provide means to compare the flow meter readout with the calculated output of the anti-strip pump.

Provide a system that displays the accumulated anti-strip quantity being delivered to the mixer unit in gallons [liters] to the nearest gallon [liter] or in units of tons [metric tons] to the nearest 0.001 ton [0.001 tonne].

Calibrate and adjust the system to maintain an accuracy of ± 1 percent.

Calibrate each plant set-up before producing the mixture.

“Stick” the anti-strip tank at the end of the day’s production to verify anti-strip usage quantities. The Engineer may require “sticking” on a daily basis.

Ensure the system has a spigot for sampling the binder and anti-strip after blending.

Use alternative blending and metering systems only when pre-approved by the Engineer.

C.3 Coating and Anti Stripping Additive3161

D Bituminous Tack Coat2357

E Mixture Design

E.1 Submittal Location

Submit documentation and sample aggregate materials for review to the District Materials Laboratory.

E.2 Aggregate Quality

Provide aggregate in accordance with 3139.2.

E.3 Restrictions

Do not add aggregates and materials not included in the original mixture submission unless otherwise approved by the Engineer.

E.4 Responsibility

Design a gyratory mixture that meets the requirements of this specification in accordance with the following:

- (1) Most current AASHTO T 312, MnDOT modified,
- (2) The Asphalt Institute's Superpave Mix Design Manual SP-2 (Use a 2 h short term aging period for volumetric), and
- (3) The Laboratory Manual.

E.5 Type of Mixture Design Submittal

E.5.a Option 1 — Laboratory Mixture Design

E.5.a(1) Aggregate

Submit the aggregate samples for option 1, at least 15 working days before beginning production samples for quality testing. At least 30 calendar days before beginning asphalt production, submit samples of aggregates that require the magnesium sulfate soundness test to the District Materials Laboratory. Test the samples for quality of each source, class, type, and size of virgin and non-asphaltic salvage aggregate source used in the mix design. Retain a companion sample of equal size until the Department issues a Mixture Design Report. Provide 24 h notice of intent to sample aggregates to the Engineer. Provide samples in accordance with the following:

Table 2360-4 Aggregate Sample Size		
Classification	Sieve	Weight
Virgin	Retained on No. 4 [4.75 mm]	80 lb [35 kg]
Virgin	Passing No. 4 [4.75 mm]	35 lb [15 kg]
Recycled asphalt pavement (RAP)	—	80 lb [35 kg]
Recycled asphalt shingles (RAS)	—	10 lb [5 kg] sample of representative RAS material

E.5.a(2) Mixture Sample

At least 7 working days before the start of asphalt production, submit the proposed Job Mix Formula (JMF) in writing and signed by a Level II Quality Management mix designer for each combination of aggregates to be used in the mixture. Include test data to demonstrate conformance to mixture properties as specified in Table 2360-7, "Mixture Requirements," and 3139.2, "Bituminous Aggregates." Use forms approved by the Department for the submission.

Submit an uncompacted mixture sample plus briquettes, in conformance with the JMF, compacted at the optimum asphalt content and required compactive effort for laboratory examination and evaluation. Provide a mixture sample size and the number of compacted briquettes and in accordance with the following:

Table 2360-5 Mixture Sample Requirements	
Item	Gyratory Design
Uncompacted mixture sample size	75 lb [30 kg]
Number of compacted briquettes	2

E.5.a(3) Tensile Strength Ratio Sample

At least 7 days before actual production, submit sample to the District Materials Laboratory for verification of moisture sensitivity retained tensile strength ratio (TSR). The Engineer may test material submitted for TSR verification for maximum specific gravity G_{mm} compliance in addition to TSR results. The Engineer will reject the submitted mix design if the tested material fails to meet the G_{mm} tolerance. If the Engineer rejects a mix design, submit a new mix design in accordance with 2360.2.E, "Mixture Design." The Contractor may use one of the following options to verify that the TSR meets the requirements in Table 2360-7, "Mixture Requirements."

E.5.a(4) Option A

Batch material at the design proportions including optimum asphalt. Split the sample before curing and allow samples to cool to room temperature, approximately 77 °F [25 °C]. Submit 80 lb [35 kg] of mixture to the District Materials Laboratory for curing and test verification. Use a cure time of 2 h ±15 minutes at 290 °F [144 °C] cure time for both groups and follow procedures Laboratory Manual Method 1813.

E.5.a(5) Option B

Batch and cure in accordance with Option A. Compact, and submit briquettes and uncompacted mixture in accordance with Table 2360-6, "Option B Mixture Requirements."

Table 2360-6 Option B Mixture Requirements	
Item	Gyratory Design
Un-compacted mixture sample size	8,200 g
Number of compacted briquettes*	6
Compacted briquette air void content	6.5 % – 7.5 %
* 6 in [150 mm] specimens.	

For both options, cure for 2 h ±15 min at 290° F [144° C] meeting the requirements in the MnDOT Laboratory Manual Method 1813.

E.5.a(6) Aggregate Specific Gravity

Determine the specific gravity of aggregate in accordance with Laboratory Manual Methods 1204 and 1205.

E.5.b Option 2 — Modified Mixture Design

The Contractor may use the modified mixture design if testing shows that the aggregates meet the requirements of 3139.2 in the current construction season and if the Level II mix designer submitting the mixture design has at least 2 years' experience in mixture design. The Department will not require mixture submittal.

E.5.b(1) Mixture Aggregate Requirements

Size, grade, and combine the aggregate fractions in proportions that are in accordance with 3139.2.

E.5.b(2) JMF Submittal

At least 2 working days before beginning asphalt production, submit a proposed JMF in writing to the District Materials Laboratory signed by a Level II Quality Management mix designer for each combination of aggregates. For each JMF submitted, include documentation in accordance with 2360.2.E.5.a, "Option1 – Laboratory Mixture Design," to demonstrate conformance to mixture properties as specified in Table 2360-7, "Mixture Requirements," and Table 3139-3, "Mixture Aggregate Requirements." Submit the JMF on forms approved by the Department.

E.5.b(3) Initial Production Test Verification

The Department will take a mix verification sample within the first four samples at the start of production of each mix type. A Field tensile strength ratio (TSR) sample will be taken and tested within the first 5,000 tons [4500 tonnes] of the start of production if required by the Engineer.

E.6 Mixture Requirements

The Department will base mixture evaluation on the trial mix tests and in accordance with Table 2360-7, "Mixture Requirements."

Table 2360-7				
Mixture Requirements				
Traffic Level	2	3	4	5
20 year design ESALs	< 1 million	1 – 3 million	3 – 10 million	10 – 30 million
Gyratory mixture requirements:				
Gyrations for N _{design}	40	60	90	100
% Air voids at N _{design} , wear	4.0	4.0	4.0	4.0
% Air voids at N _{design} , Non-wear and all shoulder	3.0	3.0	3.0	3.0
Adjusted Asphalt Film Thickness, minimum μ	8.5	8.5	8.5	8.5
TSR*, minimum %	75	75	80†	80†
Fines/effective asphalt	0.6 – 1.2	0.6 – 1.2	0.6 – 1.2	0.6 – 1.2
Ratio of Added New Asphalt Binder to Total Asphalt Binder,⁽¹⁾ min%:				
All Binder Grades	70	70	70	70
Max. Allowable RAP Percentage² (shingles are included as part of the allowable RAP percentage)				
PG 58-34, PG 64-34, PG 70-34	20	20	20	20
<p>* Use 6 in [150 mm] specimens in accordance with 2360.2.I, “Field Tensile Strength Ratio (TSR).”</p> <p> MnDOT minimum = 65</p> <p>† MnDOT minimum = 70</p> <p>¹ The ratio of added new asphalt binder to total asphalt binder needs to meet the requirements in Table 2360-7 in both mixtures that contain RAP and in mixtures that include shingles as part of the allowable RAP percentage. ((added binder/total binder) x 100 \geq 70).</p> <p>² The Contractor can elect to use a blending chart to verify compliance with the specified binder grade for RAP > 20%. The Department may take production samples to ensure the asphalt binder material meets the requirements. The blending chart is on the Bituminous Office Website.</p>				

E.7 Coarse/Fine Mixture Determination

Base the determination of coarse and fine graded mixtures on the percentage of material passing the No. 8 [2.36 mm] sieve in accordance with Table 2360-8, “Coarse/Fine Mixture Determination.”

Table 2360-8		
Coarse/Fine Mixture Determination		
Gradation	Fine Mixture, % passing No. 8 [2.36 mm]	Coarse Mixture, % passing No. 8 [2.36 mm]
A	—	—
B	> 39	\leq 39
C	> 35	\leq 35
D	—	—

E.8 Adjusted Asphalt Film Thickness (Adj. AFT)..... MnDOT Laboratory Manual Method 1854

Ensure the adjusted asphalt film thickness (Adj. AFT) of the mixture at design and during production meets the requirements of Table 2360-7, “Mixture Requirements.” Base the Adj. AFT on the calculated aggregate surface area (SA) and the effective asphalt binder content.

E.9 Documentation

Include the following documentation and test results with each JMF submitted for review:

- (1) Names of the individuals responsible for the QC of the mixture during production,
- (2) Low project number of the contract on which the mixture will be used,
- (3) Traffic level and number of gyrations,
- (4) The following temperature ranges as supplied by the asphalt binder supplier:
 - (4.1) Laboratory mixing and compaction,
 - (4.2) Plant discharge, and
 - (4.3) Field compaction.
- (5) The percentage in units of 1 percent (except the No. 200 sieve [0.075 mm] in units of 0.1 percent) of aggregate passing each of the specified sieves (including the No. 16, No. 30, No. 50, and No. 100) for each aggregate to be incorporated into the mixture. Derive the gradation of the aggregate from the RAP after extracting the residual asphalt.
- (6) Source descriptions of the following:
 - (6.1) Location of material,
 - (6.2) Description of materials,
 - (6.3) Aggregate pit or quarry number, and
 - (6.4) Proportion amount of each material in the mixture in percent of total aggregate.
- (7) Composite gradation based on (5) and (6) above. Include virgin composite gradation based on (6) and (7) above for mixtures containing RAP/RAS.
- (8) Bulk and apparent specific gravities and water absorption (by % weight of dry aggregate). Both coarse and fine aggregate, for each product used in the mixture (including RAP/RAS). Use MnDOT Laboratory Manual Method 1204 and 1205. The tolerance allowed between the Contractor's and the Department's specific gravities are $G_{sb}(\text{individual}) = 0.040 [+4 \text{ and } -4]$ and $G_{sb}(\text{combined}) = 0.020$.
- (9) FHWA 0.45 power chart represented by the composite gradation plotted on Federal Form PR-1115
- (10) Test results from the composite aggregate blend at the proposed JMF proportions showing compliance with Table 3139-3:
 - (10.1) Coarse Aggregate Angularity,
 - (10.2) Fine Aggregate Angularity, and
 - (10.3) Flat and Elongated
- (11) Extracted asphalt binder content for mixtures containing RAP/RAS with no retention factor included.
- (12) Asphalt binder percentage in units of 0.1 percent based on the total mass of the mixture and the PG grade.
- (13) Each trial mixture design includes the following:
 - (13.1) At least 3 different asphalt binder contents (with at least 0.4 percent between each point), with at least one point at, one point above and one point below the optimum asphalt binder percentage.
 - (13.2) Maximum specific gravity for each asphalt binder content calculated based on the average of the effective specific gravities measured by using at least two maximum specific gravity tests at the asphalt contents above and below the expected optimum asphalt binder content.
 - (13.3) Test results on at least two specimens at each asphalt binder content for the individual and average bulk specific gravities, density, and heights.
 - (13.4) Percent air voids of the mixture at each asphalt binder content.
 - (13.5) Adj. AFT for each asphalt binder content.
 - (13.6) Fines to Effective Asphalt (F/A) ratio calculated to the nearest 0.1 percent.
 - (13.7) TSR at the optimum asphalt binder content.
 - (13.8) Graphs showing air voids, adjusted AFT, G_{mb} , G_{min} and unit weight vs. percent asphalt binder content for each of the three asphalt binder contents submitted with trial mix.

- (13.9) Evidence that the completed mixture will conform to design air voids (V_a), Adj. AFT, TSR, F/A_e (Fines to effective asphalt ratio).
- (13.10) Gyratory densification tables and curves generated from the gyratory compactor for all points used in the mixture submittal.
- (13.11) % new asphalt binder to total asphalt binder.
- (14) The Contractor has the option of augmenting the submitted JMF with additional sand or rock. When using this option, provide samples of the aggregate for quality analysis in accordance with 2360.2.E.5, "Type of Mixture Design Submittal." Also provide mix design data for two additional design points per add-material. Provide one point to show a proportional adjustment to the submitted JMF that includes 5 percent, by weight, add-material at the JMF optimum asphalt percent. Provide a second point to show a proportional adjustment to the submitted JMF that includes 10 percent, by weight, add material at the JMF optimum asphalt percent. Report the following information for each of these two points:
 - (14.1) The maximum specific gravity determined by averaging two tests,
 - (14.2) Test results showing the individual and average bulk specific gravity, density, and height of at least two specimens at the optimum asphalt binder content,
 - (14.3) Percent air voids for the mixture for each point,
 - (14.4) Fines to Effective Asphalt ratio calculated to the nearest 0.1 of a percent,
 - (14.5) Crushing of the coarse and fine aggregate,
 - (14.6) Adj. AFT, and,
 - (14.7) Up to two add materials will be allowed.

F Mixture Design Report

The Department will provide a Mixture Design Report consisting of the JMF. Include the following in the JMF:

- (1) Composite gradation,
- (2) Aggregate component proportions,
- (3) Asphalt binder content of the mixture,
- (4) Design air voids,
- (5) Adj. asphalt film thickness, and
- (6) Aggregate bulk specific gravity values.

Show the JMF limits for gradation control sieves in accordance with aggregate gradation broadbands shown in Table 3139-2, percent asphalt binder content, air voids, and Adj. AFT. If the Department issues a Mixture Design Report, this report only confirms that the Department reviewed the mixture and that it meets volumetric properties. The Department makes no expressed or implied guaranty or warranty regarding placement and compaction of the mixture.

Provide materials meeting the requirements of the aggregate and mixture design before issuing a Mixture Design Report. The Department will review two trial mix designs per mix type designated in the plan per contract at no cost to the Contractor. The Department will verify additional mix designs at a cost of \$2,000 per design.

Provide a Department - reviewed Mixture Design Report for all paving except for small quantities of material as described in 2360.3.G, "Small Quantity Paving."

For city, county, and other agency projects, provide the District Materials Laboratory a complete project proposal, including addenda, supplemental agreements, change orders, and plans sheets, including typical sections, affecting the mix design before the Department begins the verification process.

G Mixture Quality Management

G.1 Quality Control (QC)

The Contractor will perform Quality Control (QC) as part of the production process. QC is the process control of the operations related to mixture production and determining the quality of the mixture being produced. The QC sample is the Contractor's sample taken and tested during production and used to control the production process. Provide and maintain a QC program for plant mix asphalt production, including mix design, process control inspection, sampling and testing, and adjustments in the process related to the production of an asphalt pavement.

G.1.a Certification

Provide the following to obtain certification:

- (1) Completed and submitted request form application for plant inspection.
- (2) Site map showing stockpile locations.
- (3) Signed asphalt plant inspection report showing the plant and testing facility passed as documented by Asphalt Plant Inspection Report (TP 02142-02, TP 02143-02). The inspection report must also include documentation showing plant and laboratory equipment has been calibrated and is being maintained to the tolerance shown in the Bituminous Manual and sections 1200, 1800, and 2000 of the MnDOT Laboratory Manual.
- (4) A Department-signed Mixture Design Report (MDR) before mixture production.

G.1.b Maintaining Certification

Maintain plant certification by documenting the production and testing of the certified plant asphalt mixtures. Sample and test asphalt mixtures in accordance with this section and meeting the requirements of the Schedule of Materials Control.

G.1.b(1) Annual Certification

Perform annual certification after winter suspension.

G.1.b(2) Sampling Rate

Sample at the rate in accordance with 2360.2.G.6 and the requirements of the Schedule of Materials Control.

G.1.b(3) Plant Moved

Recertify the plant if the plant moves to a new or previously occupied location.

G.1.c. Plant Certification Revocation

The Engineer may revoke certification for any of the following reasons:

- (1) If the mix does not meet the requirements of 2360.2.E.6 and 3139.2,
- (2) If there is a failure to meet the testing rates, or
- (3) If it is determined records were falsified.

If the Engineer revokes plant certification, the Department may revoke the Technical Certification of the individual or individuals involved. The Department will maintain a list of companies with revoked certifications.

G.2 Quality Assurance (QA)

The Engineer will perform Quality Assurance (QA) as part of the acceptance process. QA is the process of monitoring and evaluating various aspects of the Contractor's testing as described below. The QA sample is the Department's companion sample to the Contractor's QC sample. QA testing is performed to accept the work. The Engineer will perform the following:

- (1) Conduct QA and verification sampling and testing,
- (2) Observe the QC sampling and tests,
- (3) Monitor the required QC summary sheets and control charts,
- (4) Verify calibration of QC laboratory testing equipment,
- (5) Communicate Department test results to the Contractor's personnel on a daily basis, and
- (6) Ensure Independent Assurance (IA) sampling and testing requirements are met.

If the Engineer observes that the Contractor is not performing sampling and quality control tests in accordance with the applicable test procedures, the Engineer may stop production until the Contractor takes corrective action. The Engineer will notify the Contractor of observed deficiencies promptly, both verbally and in writing.

The Engineer may obtain additional samples, at any time and location during production, to determine quality levels in accordance with 2360.2.G.3, "Verification Sample."

The Department will post a chart with the names and telephone numbers for the personnel responsible for QA.

The Engineer will calibrate and correlate laboratory testing equipment in accordance with the Bituminous Manual and Laboratory Manual.

Table 2360-9	
Allowable Differences between Contractor and Department Test Results*	
Item	Allowable Difference
Mixture bulk specific gravity (G_{mb})	0.030
Mixture maximum specific gravity (G_{mm})	0.019
Adjusted AFT (calculated)	1.2
Fine Aggregate Angularity, uncompacted voids (U) %	1
Coarse Aggregate Angularity, % fractured faces (%P)	15
Aggregate Individual Bulk Specific Gravity (+ No. 4 [+4.75 mm])	0.040
Aggregate Individual Bulk Specific Gravity (- No. 4 [-4.75mm])	0.040
Aggregate combined blend Specific Gravity (G_{sb})	0.020
Tensile strength ratio (TSR), %	Table 2360-7
Asphalt binder content:	
Meter method, %	0.2
Spot check method, %	0.2
Chemical extraction methods, %	0.4
Incinerator oven, %	0.3
Chemical vs. meter, spot check, or incinerator methods	0.4
Incinerator oven vs. spot check	0.4
Gradation sieve, % passing:	
1 in [25.0 mm], ¾ in [19.0 mm], ½ in [12.5 mm], ⅜ in [9.5 mm]	6
No. 4 [4.75 mm]	5
No. 8 [2.36 mm], No. 16 [1.18 mm], No. 30 [0.60 mm]	4
No. 50 [0.30 mm]	3
No. 100 [0.15 mm]	2
No. 200 [0.075 mm]	1.2
* Test tolerances listed are for single test comparisons.	

G.3 Verification Sample

The Department will test a verification sample to assure compliance of the Contractor's QC program. The Department will provide the Contractor a verification companion, which is defined as a companion sample to the verification sample MnDOT uses. Take all verification samples from behind the paver. Test and use this verification companion sample as part of the QC program. Use the verification companion sample to replace the next scheduled QC sample. The Department recommends sampling enough material to accommodate retesting in case the samples fail.

The Department will perform verification testing on at least one set of production tests in accordance with 2360.2.G.6.b, "Production," and 2360.2.G.7, "Production Test," on a daily basis per mix type. Use the verification companion sample to verify the requirements of Table 3139-2, Table 3139-3, and Table 2360-7. Compare the verification companion sample to the verification sample for compliance with allowable tolerances in Table 2360-9, "Allowable Differences between Contractor and Department Test Results." These include the mixture properties of G_{mm} (mixture maximum gravity), G_{mb} (mixture bulk gravity), asphalt binder content, Adjusted AFT (calculated), Coarse and Fine Aggregate crushing, and gradation. Perform one test per week on a verification companion for coarse and fine aggregate crushing meeting the requirements of 2360.2.G.7.g "Coarse Aggregate Angularity" and 2360.2.G.7.h, "Fine Aggregate Angularity." These do not include the aggregate bulk specific gravity G_{sb} , fines to effective asphalt, or the tensile strength ratio (TSR). Determine the asphalt binder content and gradation in accordance with the extraction method specified in 2360.2.G.7.a, "Asphalt Binder Content," or 2360.2.G.7.b, "Gyratory Bulk Specific Gravity."

The Contractor may access the Department's verification test results for G_{mm} (mixture maximum gravity), G_{mb} (mixture bulk gravity), air voids (calculated), asphalt binder content, Adj. AFT (calculated) within 2 working days from the time the sample is delivered to the District Laboratory. The Department will provide the gradation and crushing results to the Contractor within three working days. The Department will include the verification test results on the test summary sheet. The Department will compare the results with the Contractor's verification companion for the allowable tolerances in Table 2360-9, "Allowable Differences between Contractor and Department Test Results." The Department will consider the verification process complete if the Contractor's verification companion meets the tolerances in Table 2360-9.

If the tolerances between the Contractor's verification companion and the Department's verification sample do not meet the requirements of Table 2360-9, the Department will retest the material. If the retests fail to meet tolerances, the Department will substitute the Department's verification test results for the Contractor's results in the QC program and use those results for acceptance. The Department will only substitute the out-of-tolerance parameters and will recalculate volumetric properties if applicable.

If the Adj. AFT calculation does not meet the tolerance, equalize the Department Adj. AFT result by increasing the original Department value by 0.5 microns. Use the increased Department Adj. AFT for the Individual Adjusted AFT result and to calculate the Moving Average Adj. AFT results. The increased Department Adj. AFT will form the basis for acceptance.

If the verification sample retests do not meet tolerances, the Department will immediately investigate the cause of the difference that will include a review of testing equipment, procedures, worksheets, gyratory specimen height sheets, and personnel to determine the source of the problem. The Engineer may require both the Department and Contractor to perform at least one hot-cold comparison of mixture properties.

To perform a hot-cold comparison, split the sample into three representative portions. The Engineer will observe the Contractor testing. Immediately compact one part while still hot. Apply additional heating to raise the temperature of the sample to compaction temperature if necessary. Allow the second and third part to cool to air temperature. Retain the second part and transport the third part to the District Materials Laboratory. On the same day and at the same time as the District Materials Laboratory, heat samples to compaction temperature and compact. Develop a calibration factor to compare the specific gravity of the hot compacted samples to reheated compacted samples. Use at least two gyratory specimens for each test. The Engineer or the Contractor may request that this test be repeated. Reheat mix samples to 160° F [70° C] to allow splitting of the sample into representative fractions for the various tests. Do not overheat the mixture portions used for testing maximum specific gravity test.

The Department will test the previously collected QA samples until they meet the tolerances or until the Department has tested all of the remaining samples. After testing the samples, the Department will test QA samples subsequent to the verification sample until tolerances are met. The Department will base acceptance on QC data. The Department will base acceptance on QC data with substitution of Department test results for those parameters out of tolerance. Cease mixture production and placement if reestablished test results do not meet tolerances within 48 h. Resume production and placement only after meeting the tolerances. The process for dispute resolution is available on the Bituminous Office website.

If the Engineer analyzes the data using methods for determination of bias on file in the Bituminous Office and finds a bias in the test results, the Engineer will specify which results to use. If through analysis of data, it is determined that there is a bias in the test results, the Engineer will determine which results are appropriate and will govern.

G.4 Contractor Quality Control

G.4.a Personnel

Submit an organizational chart listing the names and phone numbers of individuals and alternates responsible for the following:

- (1) Mix design,
- (2) Process control administration, and
- (3) Inspection.

Provide QC technicians certified as a Level I Bituminous Quality Management (QM) Tester meeting the requirements of the MnDOT Technical Certification Program for QC testing and Level II Bituminous QM Mix Designer to make process adjustments. Provide at least one person per paving operation certified as a Level II Bituminous Street Inspector.

Provide a laboratory with equipment and supplies for Contractor quality control testing and maintain with the following:

- (1) Up-to-date equipment calibrations and a copy of the calibration records with each piece of equipment,
- (2) Telephone,
- (3) Fax and copy machine; however, the Engineer may waive the requirement to have a fax machine if internet and email are available,
- (4) Internet and Email,
- (5) Computer,
- (6) Printer, and
- (7) Microsoft Excel, version 2007 or newer

Laboratory equipment need to meet the requirements listed in Section 400 of the Bituminous Manual, Laboratory Manual, and these specifications, including having extraction capabilities. Before beginning production, the laboratory equipment needs to be calibrated and operational.

Calibrate and correlate all testing equipment in accordance with the Bituminous Manual and Laboratory Manual. Keep records of calibration for each piece of testing equipment in the same facility as the equipment.

G.4.b Sampling and Testing

Take QC/QA samples from behind the paver or when approved by the Engineer from the truck box at the plant site. Sample randomly and in accordance with the Schedule of Materials Control. QC/QA samples are to be quartered from a larger sample of mixture. The procedure for truck box sampling is on the Bituminous Office website. The Engineer may also approve alternate sampling locations. Store compacted QC mixture specimens and loose QC and Department's QA mixture companion samples for 10 calendar days. Label these split companion samples with companion numbers. Determine random numbers and locations using the Bituminous Manual, Section 5-693.7 Table A or ASTM D 3665, Section 5.

G.5 Production Test Requirements

Determine the planned tonnage [metric tons] for each mixture planned for production during the production day. Divide the planned production by 1,000 and round to the next highest whole number. The result is the number of production tests required for the mixture. Table 2360-11, "Production Testing Rates" shows the required production tests.

Split the planned production into even increments and select sample locations as described above. If actual tonnage is greater than the planned tonnage, repeat the calculation above and provide additional tests if the calculation results in a higher number of production tests. During production, the Department will not require mixture volumetric property tests if mix production is no greater than 300 ton [270 tonne]. Provide production tests if the accumulative weight on successive days is greater than 300 ton [270 tonne].

If there is a choice of more than one MnDOT approved test procedure, select one method at the beginning of the project with the approval of the Engineer and use that method for the entire project. The Contractor and Engineer may agree to change test procedures during the construction of the project.

G.5a Establishing an Ignition Oven Correction FactorMnDOT Lab. Manual 1853 Appendix

On the first day of production, for each mixture type, both the Contractor and the Agency will establish an ignition oven correction factor from the produced mixture. Re-establish correction factors when:

There are aggregate or RAP substitutions

There are 3 or more tolerance failures on the extracted asphalt content between the Agency and the Contractor as defined by Table 2360-9, "Allowable Differences between Contractor and Department Test Results".

G.6 Production Testing Rates

G.6.a Start –Up

At the start of production, for the first 2,000 ton [1,800 tonne] of each mix type, perform testing at the following frequencies:

Table 2360-10 Production Start-Up Testing Rates			
Production Test	Testing Rates	Laboratory Manual Method	Section
Bulk Specific Gravity	1 test per 500 ton [450 tonne]	1806	2360.2.G.7.b
Maximum Specific Gravity	1 test per 500 ton [450 tonne]	1807	2360.2.G.7.c
Air Voids (calculated)	1 test per 500 ton [450 tonne]	1808	2360.2.G.7.d
Asphalt Content	1 test per 500 ton [450 tonne]	1853	2360.2.G.7.a
Add AC/Total AC Ratio (calculated)	1 test per 1000 ton [900 tonne]	1853	2360.2.G.7.a
Adj. AFT (Calculated)	1 test per 500 ton [450 tonne]	1854	2360.2.E.6.b
Gradation	1 test per 500 ton [450 tonne]	1203	2360.2.G.7.f
Coarse Aggregate Angularity	1 test per 1,000 tons [900 tonne]	1214	2360.2.G.7.g
Fine Aggregate Angularity (FAA)	1 test per 1,000 ton [900 tonne]	1206	2360.2.G.7.h
Fines to Effective Asphalt Ratio (calculated)	1 test per 500 ton [450 tonne]	1203 & 1853	2360.2.G.7.f & 2360.2.G.7.a

G.6.b Production

After producing the first 2,000 ton [1,800 tonne] of each mix type test at the following frequencies:

Table 2360-11 Production Testing Rates			
Production Test	Sampling and Testing Rates	Test Reference	Section
Bulk Specific Gravity	Divide the planned production by 1,000. Round the number to the next higher whole number	Laboratory Manual 1806	2360.2.G.7.b
Maximum Specific Gravity	Divide the planned production by 1,000. Round the number to the next higher whole number.	Laboratory Manual 1807	2360.2.G.7.c
Air Voids (calculated)	Divide the planned production by 1,000. Round the number to the next higher whole number	Laboratory Manual 1808	2360.2.G.7.d
Asphalt Content	Divide the planned production by 1,000. Round the number to the next higher whole number	Laboratory Manual 1853	2360.2.G.7.a
Add AC/Total AC Ratio (calculated)	Divide the planned production by 2000. Round the number to the next higher whole number	Laboratory Manual 1853	2360.2.G.7.a
Adj. AFT (Calculated)	Divide the planned production by 1,000. Round the number to the next higher whole number	Laboratory Manual 1854	2360.2.E.7.e
Gradation	1 gradation per 1,000 tons [900 tonne], or portion thereof (at least one per day)	Laboratory Manual 1203	2360.2.G.7.f
Coarse Aggregate Angularity	2 tests per day for at least 2 days, then 1 per day if CAA is met. If CAA >8% of requirement, 1 sample per day but test 1 per week.	Laboratory Manual 1214	2360.2.G.7.g
Fine Aggregate Angularity (FAA)	2 tests per day for at least 2 days, then 1 per day if FAA is met. If FAA >5% of requirement, 1 sample per day but test 1 per week.	Laboratory Manual 1206	2360.2.G.7.h
Fines to Effective Asphalt Ratio (calculated)	Divide the planned production by 1,000. Round the number to the next higher whole number	Laboratory Manual 1203 & 1853	2360.2.G.7.f & 2360.2.G.7.a
TSR	As directed by the Engineer	Laboratory Manual 1813	2360.G.7.i
Aggregate Specific Gravity	As directed by the Engineer	Laboratory Manual 1204, 1205, and 1815	2360.G.7.j
Mixture Moisture Content	Daily unless otherwise required by the Engineer	Laboratory Manual 1805	2360.G.7.k
Asphalt Binder	Sample first load (each grade), then 1 per 250,000 gal sample size 1 qt [1,000,000 L]	MnDOT Bituminous Manual 5-693.920	2360.G.7.l

G.7 Production Tests

G.7.a Asphalt Binder Content

Use spot check for determination of asphalt binder content in virgin mixtures only. See the requirements of the Bituminous Manual.

Spotchecks are required only when the Engineer has waived the requirements of 2360.2G8 relating to furnishing a computerized printout of the plant blending control system. A minimum of 1 spotcheck per day per mixture blend is required to determine the new added asphalt binder.

Use an incinerator oven meeting the requirements of the Laboratory Manual Method 1853. Do not use the incinerator oven if the percentage of Class B material is greater than 50 percent within the composite blend, unless the Contractor determines a correction factor approved by the Engineer.

Perform chemical extraction meeting the requirements of Laboratory Manual Method 1851 or 1852.

Use the meter method for determination of asphalt binder content in virgin mixtures only. See the requirements of the Bituminous Manual 5-693.710.

G.7.b Gyratory Bulk Specific Gravity, Gmb

Use two specimens to determine gyratory bulk specific gravity meeting the requirements of Laboratory Manual Method 1806. Set Gyratory to an internal angle of $1.16^{\circ} \pm 0.02^{\circ}$ according to AASHTO TP 71.

G.7.c Maximum Specific Gravity, Gmm

Determine maximum specific gravity meeting the requirements of Laboratory Manual Method 1807.

G.7.d Air Voids – Individual and Isolated (Calculation)

Calculate the individual and isolated air voids meeting the requirements of Laboratory Manual Method 1808. Use the maximum mixture specific gravity and corresponding bulk specific gravity from a single test to calculate the isolated air voids. Use the maximum specific gravity moving average and the bulk specific gravity from a single test to calculate the individual air voids.

Compact gyratory design to N_{design} in accordance with Table 2360-7, “Mixture Requirements” for the specified traffic level.

G.7.e Adjusted Asphalt Film Thickness (AFT) (Calculation)

Calculate the Adj. AFT meeting the requirements of the Laboratory Manual Method 1854.

G.7.f Gradation – Blended Aggregate

Determine the gradation of blended aggregate sample, from an extracted bituminous mixture, meeting the requirements of Laboratory Manual Method 1203.

G.7.g Coarse Aggregate Angularity

Test the Coarse Aggregate Angularity (CAA) meeting the requirements of Laboratory Manual Method 1214 to determine the CAA on composite blend from aggregates used in production of hot mix asphalt. Ensure CAA test results meet the requirements in accordance with Table 3139-3.

The Contractor may test mixtures containing virgin aggregates from composite belt samples. Test mixtures containing RAP from extracted aggregates taken from standard production samples. Test the percentage of fractured faces of the composite aggregate blend less than 100 percent twice a day for each mixture blend for at least two days, then one test per day if the test samples meet the CAA requirements. If the CAA crushing test results are greater than 8 percent of the requirements, take one sample per day and perform one test per week.

Report CAA results on the test summary sheet. The Department may reduce payment in accordance with Table 2360-15, "Reduced Payment Schedule for Individual Test Results," for mixture placed and represented by results below the minimum requirement in accordance with Table 3139-3. The Department will calculate tonnage subjected to reduced payment as the tons placed from the sample point of the failing test to the sampling point where the test result meets the specifications.

G.7.h Fine Aggregate Angularity

Use Laboratory Manual Method 1206 to test the composite blend from aggregates used in production of asphalt mixtures for Fine Aggregate Angularity (FAA) meeting the requirements of Table 3139-3. The Contractor may test mixtures that contain virgin aggregates from composite belt samples. Test mixtures that contain RAP from extracted aggregates taken from standard production samples. Perform two tests per day for each mixture blend for at least two days to test the percentage of uncompacted voids from the composite aggregate blend, then one test per day if the samples meet FAA requirements. If FAA test results are greater than 5 percent of the requirement, take one sample per day and one test per week.

Report FAA results on the test summary sheet. The Department may reduce payment in accordance with Table 2360-16, "Reduced Payment Schedule for Individual Test Results," for mixture placed and represented by results below the minimums in accordance with Table 3139-3. The Department will calculate tonnage subjected to reduced payment as the tons placed from the sample point of the failing test to the sampling point where the test result meets the specifications.

G.7.i Field Tensile Strength Ratio (TSR)Laboratory Manual Method 1813

If the Engineer requires sampling and testing of the mixture to verify tensile strength ratio (TSR), both the Contractor and the Department will be required to test these samples within 72 h after sampling. The Contractor shall obtain a sample weighing at least 110 lb [50 kg] and split the sample in half to provide a sample for the Department and the Contractor. Label the Department companion of this split with the following information:

- (1) Date,
- (2) Time,
- (3) Project number, and
- (4) Cumulative tonnage to date.

After the sample is split and labeled, give the Department's companion sample to the Department Street Inspector or Plant Monitor or to the Materials Engineer within 24 h of sampling as directed by the Engineer. When using Option 2, obtain the sample within the first 5,000 ton [4,500 tonne] of plant mixed asphalt produced or by the second day of production, whichever comes first, to verify tensile strength ratio (TSR). Take mixture samples from behind the paver unless the Engineer approves an alternate sampling location. Provide a 6 in [150 mm] specimen for gyratory design. The Contractor may test the sample at a permanent lab site or a field lab site.

Refer to Table 2360-12, "Mixture Type, Minimum TSR," for the minimum acceptable TSR values for production. Stop production immediately if the material does not meet minimum TSR requirements. Do not resume production until after adding anti-strip to the asphalt binder. Determine the responsible party for the cost of the anti-strip in accordance with the Department and Contractor TSR values in Table 2360-13. If the Department is responsible for the cost of the anti-strip, the Department will only pay for the cost of the anti-strip for mixtures placed on that project. The Department will not pay for delay costs associated with making changes related to this testing.

Table 2360-12			
Mixture Type, Minimum TSR			
Traffic Level 2 – 3, %		Traffic Level 4 – 5, %	
Contractor	MnDOT	Contractor	MnDOT
75	65	80	70

Table 2360-13			
Anti-Strip Cost Responsibility			
Gyratory Level	Contractor TSR	MnDOT TSR	Responsibility
2 – 3	≥ 75	≥ 65	No anti-strip required
		< 65	Contractor
	< 75	≥ 65	Department
		< 65	Contractor
4 – 5	≥ 80	≥ 70	No anti-strip required
		< 70	Contractor
	< 80	≥ 70	Department
		< 70	Contractor

Take another sample and test within the first 500 ton [450 tonne] after production resumes. Stop production if the re-test fails to meet the minimum specified value. Discuss a proposal to resolve the problem with the Engineer before resuming production. Do not operate below the specified minimum TSR if at least 2 successive tests fail the TSR requirements.

A new sample and retest is automatically required if a proportion changes by greater than 10 percent from the currently produced mixture for a single stockpile aggregate or the Engineer directs the Contractor to sample and retest.

G.7.j Aggregate Specific Gravity(Gsb)..... Laboratory Manual Methods 1204, 1205, 1815

Sample and test aggregate stockpiles to verify aggregate specific gravity if directed by the Engineer in conjunction with the District Materials Engineer. Provide 90 lb [40 kg] representative stockpile samples for each aggregate component. Split samples in half to provide material for both the Department and the Contractor. Label the Department companion with the following information:

- (1) Date,
- (2) Time,
- (3) Project number, and
- (4) Approximate cumulative tonnage to date.

Give the Department companion to the Department Street Inspector or Plant Monitor immediately after splitting or to the Materials Engineer within 24 h of sampling as directed by the Engineer. The Materials Engineer will compare the aggregate specific gravity results to the Contractor's values on the current Mix Design Report. If the results deviate beyond the tolerance in accordance with Table 2360-16, "Allowable Differences between Contractor and Department Test Results," the Materials Engineer will notify the Contractor and issue a new Mix Design Report with the current specific gravity results. Base new mixture placed after receiving notification of new specific gravity values on the Department results. The Engineer will notify the Contractor regarding new specific gravity values. The dispute resolution procedure for aggregate specific gravity is on the Bituminous Office website.

G.7.k Moisture ContentLaboratory Manual Method 1855

Provide a mixture with moisture content no greater than 0.3 percent. Measure moisture content in the mixture behind the paver or, if approved by the Engineer, in the truck box. Sample and test on a daily basis

unless otherwise directed by the Engineer. Store the sample in an airtight container. Do not perform microwave testing.

Do not provide plant mixed asphalt with a moisture content greater than 0.3 percent.

G.7.1 Asphalt Binder Samples

Sample the first shipment of each type of asphalt binder, then sample at a rate of one per 250,000 gal [1,000,000 L]. Provide a 1 qt [1.0 L] sized sample. Take samples meeting the requirements of the Bituminous Manual, 5-693.920. The Inspector will monitor the sampling the Contractor performs. Record sample information on an Asphalt Sample Identification Card. Submit the sample to the Central Materials Laboratory. Contact the Department Chemical Laboratory Director for disposition of failing asphalt binder samples.

G.8 Documentation

Maintain documentation, including test summary sheets and control charts, on an ongoing basis. Maintain a file of gyratory specimen heights for gyratory compacted samples and test worksheets. File reports, records, and diaries developed during the work as directed by the Engineer. These documents become the property of the Department.

Number test results in accordance with the MDR and record on forms approved and provided by the Department.

Send production test results on test summary sheets to the District Materials Laboratory and to other sites as directed by the Engineer by 11 AM of the day following production by facsimile, or e-mail when approved by the Engineer.

Include the following production test results and mixture information on the Department approved test summary sheet:

- (1) Percent passing on all sieves in accordance with Table 3139-2 (including No. 16, No. 30, No. 50, No. 100),
- (2) Coarse and fine aggregate crushing,
- (3) Maximum specific gravity (G_{mm}),
- (4) Bulk specific gravity (G_{mb}),
- (5) Percent total asphalt binder content (P_b),
- (6) New added asphalt binder content,
- (7) Ratio of % new added asphalt binder to total asphalt binder,
- (8) Calculated production air voids (V_a),
- (9) Calculated adjusted AFT (Adj. AFT),
- (10) Composite aggregate specific gravity (G_{sb}) reflecting current proportions,
- (11) Aggregate proportions in use at the time of sampling,
- (12) Tons where sampled,
- (13) Tons represented by a test and cumulative tons produced,
- (14) Fines to effective asphalt ratio (F/A_e),
- (15) Signature Line for MnDOT and Contractor Representative,
- (16) Mixture Moisture Content, and
- (17) MnDOT verification sample test result.
- (18) Identify, when used, the WMA additive or process.

Submit copies of failing test results to the Engineer on a daily basis.

Provide the Engineer with asphalt manifests or bill of lading's (BOL) on a daily basis.

Provide a daily plant diary, including a description of QC actions taken. Include changes or adjustments on the test summary sheets.

Provide weekly truck scale spot checks.

Provide a Department approved accounting system for mixes and provide a daily and final project summary of material quantities and types.

Provide a final hard and electronic copy of QC test summary sheets and control charts, and density worksheets at completion of bituminous operations on the project to the Engineer.

Provide an automated weigh scale and computer generated weigh ticket. Ensure the ticket indicates the following information:

- (1) Project number,
- (2) Mix designation, including binder grade,
- (3) Mixture Design Report number,
- (4) Truck identification and tare,
- (5) Net mass, and
- (6) Date and time of loading.

Do not include deviations from the minimum information on the computer generated weigh ticket unless otherwise approved by the Engineer in writing.

Continue test summary sheets, charts, and records for a mixture produced at one plant site from contract to contract. Begin new summary sheets and charts annually for winter carry-over projects. Begin new summary sheets and charts when an asphalt plant is re-setup in the same location after it has moved out.

Furnish an electronic printout (long form recordation) from an automated plant blending control system at 20 minute intervals when the plant is producing mixture. The Engineer may waive this requirement if the plant does not have the capability to produce the automated blending control information; however, the Contractor must then perform daily spotchecks to determine percent new asphalt added.

Include the following information on the plant control printout for Drum Plants:

- (1) Both the virgin and recycle belt feed rates (tons/hr),
- (2) Feeder bin proportions (%),
- (3) Total % asphalt cement in the mixture,
- (4) Virgin asphalt cement added (%)
- (5) Mixture Temperature °F [°C],
- (6) Mixture code,
- (7) Date and time stamp, and
- (8) Current tons of mixture produced and daily cumulative tons of mixture produced at time of printout.

Provide a daily electronic printout of the plant calibration (SPAN) numbers for each bin and meter.

Include the following information on the plant control printout for Batch Plants:

- (1) Both the virgin and recycle belt feed rates (tons/hr),
- (2) Feeder bin proportions (%),
- (3) Mixture Temperature °F [°C],
- (4) Mixture code,
- (5) Date and time stamp, and
- (6) Current tons of mixture produced and daily cumulative tons of mixture produced at time of printout.

Provide a daily electronic printout of the plant calibration (SPAN) numbers for each bin and meter.

G.9 Control Charts

Provide control charts and summary sheets computer generated from software approved by the Engineer. The Contractor may use software available at the Bituminous Office. Record the following data on standardized control charts:

- (1) Blended aggregate gradation, include sieves in accordance with Table 3139-2 for specified mixture;
- (2) Percent asphalt binder content (P_b);
- (3) Maximum specific gravity (G_{mm});
- (4) Production air voids (V_a); and
- (5) Adj. AFT.

Unless otherwise directed by the Engineer, plot individual test results for each test point and connect individual points with a solid line. Plot the moving average for each test variable starting with the fourth test and connect with a dashed line. Plot the Department's QA and verification test results with triangles. Plot the specification JMF limits on the control charts using a dotted line.

G.10 JMF Limits

Base the production air voids and Adj. AFT on the minimum specified requirements in accordance with Table 2360-7, "Mixture Requirements." Base gradations and asphalt binder content limits on the current Department reviewed Mixture Design Report. Provide gradation control sieves in accordance with Table 3139-2. Refer to the Mixture Design Report for the mixture production targets. JMF limits are the target plus or minus the limits in accordance with Table 2360-14, "JMF Limits (N=4)." Use JMF limits as the criteria for acceptance of materials based on the moving average.

Table 2360-14 JMF Limits (N=4)	
Item	JMF Limits
Adj. AFT	- 0.5
Production air voids, %	± 1.0
Asphalt binder content, %	- 0.4
Sieve, % <i>passing</i> :	
1 in [25.0 mm], $\frac{3}{4}$ in [19.0 mm], $\frac{1}{2}$ in [12.5 mm], $\frac{3}{8}$ in [9.5 mm], No. 4 [4.75 mm]	Broad band limits
No. 8 [2.36 mm]	Broad band limits
No. 200 [0.075 mm]	Broad band limits

G.11 Moving Average Calculation

Calculate a moving average as the average of the last four test results. Continue the calculation without interruption, except begin new summary sheets and charts annually for winter carry-over projects and if an asphalt plant is re-setup in the same site after it has been moved out.

G.12 JMF Bands

JMF Bands are the area between the target, as identified on the Mixture Design Report, and the JMF limits.

G.13 JMF Adjustment

Begin mixture production with aggregate proportions within 5 percent of the design proportions and mixture parameters in Table 2360-14 within the JMF limits shown. Use all the aggregate proportions included

on the Mixture Design Report unless the aggregate proportion is shown as 0 percent. If the Contractor provides the District Materials Laboratory with prior documented production data showing how production affects the mixture properties or if the Contractor provides the District Materials Laboratory with a written justification or explanation of material changes since the original mixture submittal waive the preceding requirements.

G.13.a JMFB Request for Adjustment

The Contractor may make a request to the Bituminous Engineer or District Materials Engineer for a JMFB adjustment to the mix design if the QC test results indicate a necessary change to achieve the specified properties. Do not use aggregates or materials not part of the original mix design to make adjustments unless otherwise approved by the Engineer, in conjunction with the District Materials Engineer or the Department Bituminous Engineer.

A Certified Level II Bituminous QM Mix Designer will review the requested change for the Department. If the request meets the design requirements in Table 3139-2, "Aggregate Gradation Broad Bands", Table 3139-3, "Mixture Aggregate Requirements", and Table 2360-7, "Mixture Requirements," the Department will issue a revised Mixture Design Report. Each trial mixture design submittal in accordance with 2360.2.E, "Mixture Design" may have three JMFB adjustments per mixture per project without charge. The Department will charge the Contractor \$500 for each additional JMFB adjustment requests.

Perform an interactive process with the Engineer before making JMFB adjustments. Make JMFB adjustments only within the mixture specification gradation design broadbands in accordance with Table 3139-2. Submit a new JMFB if redesigning the mixture. Only reduce the JMFB asphalt content if the moving average Adj. AFT is 8.5 μ or more and Individual Adjusted AFT is at least 7.5 μ .

The department will not allow consecutive requests for a JMFB adjustment without production data. Continue calculation of the moving average after the approval of the JMFB.

G.13.b JMFB Request for Adjustment for Proportion Change > 10%

If requesting a JMFB adjustment for a proportion change greater than 10 percent from the currently produced mixture for a single stockpile aggregate, provide supporting production test data from at least four tests run at an accelerated testing rate of one test per 500 ton [450 tonne] with the adjustment request. The Department will base acceptable verification and approval of the requested JMFB on individual and moving average test results in addition to the requirements listed above. Individual test results must be within twice the requested JMFB limits for percent asphalt binder, production air voids, and Adj. AFT. Individual gradations must be within the Broad Bands. The moving average values must be within the control limits in accordance with Table 2360-14. Continue to calculate the moving average after the change in proportions.

If the mixture meets the design requirements as discussed in G.13.a, the District Materials Laboratory will sign the request for JMFB adjustment effective from the point of the proportion change. If the mixture fails to meet the design requirements, the Department will either reduce the payment or direct the Contractor to remove and replace. Do not make consecutive requests for JMFB adjustments without production data.

G.13.c JMFB Request for Adjustment When Cumulative Proportion Changes > 10%

Submit a request for JMFB adjustment when the cumulative change on any one product exceeds 10% from the original MDR. The Department will issue a revised MDR provided the mixture meets the requirements in Table 3139-2, "Aggregate Gradation Broad Bands", Table 3139-3, "Mixture Aggregate Requirements", and Table 2360-7, "Mixture Requirements".

G.14 Failing Materials

The Department will base material acceptance on individual and moving average test results. The Department will use isolated test results for acceptance of air voids at the start of mixture production. The Department will consider individual test results greater than two times the JMFB bands as failing. The Department

will fail moving average test results exceeding the JMF limits. Begin new summary sheets annually for winter carry-over projects.

Stop production and make adjustments if the moving average values exceed the JMF limits. Restart production after performing the adjustments and notifying the Engineer. Resume testing at the accelerated rates and for the tests listed in Table 2360-10, "Production Start-Up Testing Rates," for the next 2,000 ton [1,800 tonne] of mixture produced. Continue calculating the moving average after the stop in production.

The Department will consider mixture produced where the moving average of four exceeds the JMF limits as unsatisfactory in accordance with 2360.2.G.14.d, "Moving Average Failure at Mixture Start-Up — Production Air Voids," 2360.2.G.14.e, "Moving Average Failure at Mixture Start-Up — Adjusted AFT," 2360.2.G.14.f, "Moving Average Failure - Production Air Voids," and 2360.2.G.14.g, "Moving Average Failure — Percent Asphalt Binder Content, Gradation, and Adj. AFT."

If the total production of a mixture type for the entire project requires no greater than four tests the Department will accept the material in accordance with 2360.2.G.14.b, "Isolated Failures at Mixture Start-Up — Production Air Voids," and 2360.2.G.14.c, "Individual Failure — Gradation, Percent Asphalt Binder, Production Air Voids, and Adj. AFT."

If the Contractor's testing data fails to meet the tolerances in accordance with Table 2360-9, "Allowable Differences between Contractor and Department Test Results," the Department will substitute QA and verification data to determine the payment factor.

G.14.a Ratio of New Added Asphalt Binder to Total Asphalt Binder — Acceptance Criteria

The minimum design ratio of new added asphalt binder to total asphalt binder is 70% when a PG XX-28, PG 52-34, PG 64-22, or PG 49-34 is the specified asphalt grade. During production the ratio must meet individual and moving average requirements as listed in Table 2360-15, "Ratio of New Added Asphalt Binder to Total Asphalt Binder Acceptance Criteria". If the individual or moving average ratio drops below the minimum requirement, the Contractor must stop production and make adjustments to correct the process. Restart production only after notifying the Engineer of the adjustments made and the Contractor will conduct 2 spot checks within the next 1,000 tons [907 tonnes] of mixture produced to verify the ratio. The calculation of the moving average will continue after the stop in production.

Table 2360-15		
Ratio of New Added Asphalt Binder to Total Asphalt Binder Acceptance Criteria		
Specified PG Grade	Individual Ratio	Moving Average Ratio
PG XX-28, PG 52-34, PG 64-22, PG 49-34	66% Minimum	70% Minimum

G.14.b Isolated Failures at Mixture Start-Up — Production Air Voids

At the start-up of mixture production, use the first three isolated test results for production air voids before establishing a moving average of four. Calculate isolated production air voids using the maximum mixture specific gravity and the corresponding bulk specific gravity from that single test. After testing four samples and establishing a moving average of four, the Department will base acceptance on individual and moving average production air voids.

The Department will not accept the material if any of the first three isolated test results for production air voids exceeds twice the JMF bands from the target listed on the Mixture Design Report at the start of production. The Department will reduce payment for unacceptable material in accordance with Table 2360-16, "Reduced Payment Schedule for Individual Test Results." The Department will calculate the quantity of unacceptable material on the tonnage placed from the sample point of the failing test to the sample point when the isolated test result is back within twice the JMF bands. If the failure occurs at the first test after the start of

production, the Department will calculate the tonnage subject to reduced payment as described above, including the tonnage from the start of production.

If isolated air voids are no greater than 1.0 percent or greater than 7.0 percent, the Engineer will either reduce the payment or order the material removed and replaced at no additional cost to the Department. The Engineer may require the Contractor to test in-place mixture to better define the removal and replacement limits. The Engineer may require the Contractor to test in-place mixture placed before the failing test result. If the Engineer reduces the payment, the Department will pay for the material at 50 percent of the contract unit price.

G.14.c Individual Failure – Gradation, Percent Asphalt Binder, Production Air Voids, and Adj. AFT

Table 2360-16 Reduced Payment Schedule for Individual Test Results	
Item	Pay Factor, % *
Gradation	95
Coarse and fine aggregate crushing	90
Asphalt binder content	90
Production air voids, individual and isolated†	80
<p>* Apply the lowest pay factor when using multiple reductions on a single test. Calculate individual air voids using the moving average maximum specific gravity and the bulk specific gravity from that single test. † Calculate the isolated air voids from the maximum specific gravity and the bulk specific gravity from that single test. The Engineer will only use isolated void test results for acceptance for the first three tests after mixture production start-up.</p>	

The Department will not accept material with individual gradation tests greater than the JMF Broad Bands listed on the Mixture Design Report. The Department will reduce payment for unacceptable material in accordance with Table 2360-16, “Reduced Payment Schedule for Individual Test Results.” The Department will reduce payment to all tonnage represented by the individual test.

If the individual test result for adjusted AFT is less than 7.5 μ , the Department may either reduce payment in accordance with Table 2360-17, “Reduced Payment Schedule for Individual Test Results, Adjusted AFT,” or order the material removed and replaced represented by the individual test. This tonnage includes all material placed from the sample point of the failing test to the sample point when the test result meets specification requirements. If the failure occurs at the first test after the start of daily production, the Department will include the tonnage from the start of production that day with the tonnage subject to reduced payment or removal and replacement.

Table 2360-17 Reduced Payment Schedule for Individual Test Results, Adjusted AFT	
Individual Adjusted AFT, μ	Pay Factor, %
≥ 7.5	100
7.4 – 7.0	90
6.9 – 6.1	75
≤ 6.0	R&R ^(*)
* Remove and replace at no expense to the Department.	

The Department will not accept material if the individual tests for percent asphalt binder content or production air voids exceeds twice the JMF bands from the target listed on the Mix Design Report. The Department will reduce payment in accordance with Table 2360-16, “Reduced Payment Schedule for Individual Test Results.” The Department will calculate the material subject to reduced payment as the material placed from the sample point of the failing test until the sample point when the test result is back within twice the JMF limits. If the failure occurs at the first test after the start of daily production, the Department will include tonnage from the start of production that day with the tonnage subjected to reduced payment.

The Department will not accept material if individual air voids are no greater than 1.0 percent or greater than 7.0 percent. Remove and replace unacceptable material at no additional cost to the Department as directed by the Engineer. Test in-place mixture to better define the area to be removed and replaced as directed by the Engineer. Test mixture placed before the failing test result as directed by the Engineer. The Department may reduce payment for unacceptable material at 50 percent of the relevant contract unit price.

G.14.d Moving Average Failure at Mixture Start-Up — Production Air Voids

If a moving average failure occurs within any of the first three moving average results after mixture start-up (tests 4, 5, 6), the Department will accept the mixture if the individual air void, corresponding to the moving average failure meets the JMF limits. The Department will not accept material if the individual air void fails to meet the JMF limit. The Department will reduce payment for unacceptable material unless the Engineer determines that the isolated air void corresponding to the individual air void meets the JMF limit. The Department will pay for unacceptable material at 70 percent of the relevant contract unit price. The Department will calculate the quantity of material subject to reduce payment as the tons placed from the sample point of the failing moving average result and corresponding individual air void beyond the JMF limit to the sampling point when the individual test result is back within the JMF limit. If the failure occurs at the first test after the start of daily production, the Department will include tonnage from the start of production that day with the tonnage subjected to reduced payment.

G.14.e Moving Average Failure at Mixture Start-Up — Adj. AFT

The Engineer will calculate the Moving Average ($n=4$) Adj. AFT during the sixth test after the beginning of mixture production of that specific mixture. The Engineer will include the individual results of calculations for tests No. 3, No. 4, No. 5, and No. 6 with this calculation.

G.14.f Moving Average Failure — Production Air Voids

A moving average production air void failure occurs when the individual production air void moving average of four exceeds the JMF limit. The Department will consider the mixture unacceptable and subject to reduced payment. The Department will pay for unacceptable mixture at 70 percent of the contract unit price. The Department will calculate the quantity of mixture subject to reduced payment as the tons placed from the sample point of all individual test results beyond the JMF limits, which contributed to the moving average value that exceeded the JMF limit, to the sampling point where the individual test result meets the JMF limits. If the failure occurs at the first test after the start of daily production, the Department will include the tonnage from the start of production that day with the tonnage subject to reduced payment.

Table 2360-18 Reduced Payment Schedule for Moving Average Test Results	
Item	Pay Factor, % *
Gradation	90
Coarse and fine aggregate crushing	NA (individual failures only)
Adjusted AFT	80
Asphalt binder content	80
Production air voids	70
* Lowest Pay Factor applies when there are multiple reductions on a single test.	

G.14.g Moving Average Failure - Percent Asphalt Binder Content, Gradation, and Adj. AFT

The Engineer will consider the mixture unacceptable and subject to reduced payment for mixture properties, including asphalt binder content and gradation, where the moving average of four exceeds the JMF limits. The Department may reduce payment for unacceptable mixture properties in accordance with Table 2360-18, "Reduced Payment Schedule for Moving Average Test Results." The Department will calculate the quantity of material subject to replacement or reduced payment as the tons placed from the sample point of all individual test

results beyond the JMF limits, which contributed to the moving average value that exceeded the JMF limit, to the sampling point when the individual test result is back within the JMF limits. If the failure occurs at the first test after the start of daily production, the Department will include the tonnage from the start of production that day with the tonnage subjected to reduced payment.

The Engineer will calculate the Moving Average (n=4) Adjusted AFT during the sixth test after the beginning of mixture production of that specific mixture. The Engineer will include the individual results of calculations for tests No. 3, No. 4, No. 5, and No. 6 with this calculation. The Department will consider material with the Moving Average (n=4) of the Adjusted AFT is less than 8.0 μ as unsatisfactory and will pay for the material at 80 percent of the relevant contract unit price. The Department will calculate the quantity of material subject to replacement or reduced payment as the tons placed from the sample point of all Individual Adjusted AFT results less than 8.0 μ , which contributed to the Moving Average value that was less than 8.0 μ , to the sample point where the Individual Adjusted AFT is at least 8.0 μ . If the failure occurs at the first test after the start of daily production, the Department will include the tonnage from the start of production that day with the tonnage subject to reduced payment.

G.14.h Coarse and Fine Aggregate Crushing Failure

If any CAA or FAA test results does not meet the requirements specified in Table 3139-3, the Department may reduce payment for the placed material in accordance with Table 2360-16, "Reduced Payment Schedule for Individual Test Results." The Department will calculate the quantity of material subject to reduced payment as the tons placed from the sample point of the failing test until the sampling point where the test result meets the specifications. If the failure occurs at the first test after the start of daily production, the Department will include the tonnage from the start of production that day with the tonnage subjected to reduced payment.

2360.3 CONSTRUCTION REQUIREMENTS

A Restrictions

A.1 Asphalt Release Agents

Do not use petroleum distillates to prevent adhesion of asphalt mixtures to equipment. An asphalt release agent must meet the criteria for "Effect on Asphalt" as described in the most recent Asphalt Release Agent on file in MnDOT's Office of Environmental Services.

A.2 Edge Drop Off

When construction is under traffic, the requirements of 2221.3.D will apply.

A.3 Surge and Storage Bins

Store the asphalt mixture for no more than 18 h at storage facilities that prevent segregation of the mix and drainage of asphalt from the mix. Maintain the mixture at within 9 °F [5 °C] of the temperature when discharged from the silo or mixer and prevent excessive cooling or overheating.

A.4 Weather Limitations and Paving Date

Do not perform work within the roadway in the spring until removal of seasonal load restrictions on roads in the vicinity unless otherwise approved by the Engineer. Do not place asphalt mixtures when weather or roadbed conditions are judged unfavorable by the Engineer.

Do not place asphalt pavement final wearing course lift after October 15 north of an east-west line between Browns Valley and Holyoke, or after November 1 south of an east-west line between Browns Valley and Holyoke. The Engineer may waive these restrictions when:

- (1) The Contractor is not placing asphalt mixture on the traveled portion of the roadway,
- (2) The roadway involved is closed to traffic during the following winter, or
- (3) The Engineer provides written direction to place the mixture.

B Equipment

B.1 Plant

B.1.a Segregation

Provide plant mixed asphalt from a plant capable of producing a uniform mix free of segregation.

B.1.b Scales

Test and calibrate scales in accordance with 1901.

B.1.c Mineral Filler

Add mineral filler to the mixture using a storage silo equipped with a device to ensure a constant and uniform feed.

B.1.d Storage Tanks

Provide storage tanks equipped to heat and maintain the material at the temperatures recommended by the certified asphalt supplier. Place the discharge end of the circulating line below the surface of the asphalt material. Provide agitation for modified asphalt as recommended by the supplier.

Provide an outage table or chart and measuring stick for each storage or working tank. Equip tanks with provisions to take asphalt binder material samples. After delivery of asphalt binder material to the project, do not heat the material at temperatures greater than 350° F [175° C]. Do not store modified asphalt at temperatures greater than the manufacturer's recommendation.

B.1.e Asphalt Binder Control

If proportioning asphalt binder material by volume, equip the plant with either a working tank or a metering system to determine asphalt binder content of the mixture.

Provide a working tank with a capacity from 1,000 gal to 2,000 gal [3,800 L to 7,600 L]. Calibrate and supply the working tank with a calibrated measuring stick. The Contractor may connect the tank to a mixing unit and use it only during spot check operations as long as it is available at all times. Return feedback to the working tank during spot check operations.

Provide a metering system with at least one approved asphalt binder flow meter and a asphalt binder pump. Connect the flow meter to the asphalt binder supply to measure and display only the asphalt binder being fed to the mixer unit. Position the meter readout for convenient observation. Provide a means to compare the flow meter readout with the calculated output of the asphalt binder pump. Provide a system to display that shows the accumulated asphalt binder quantity being delivered to the mixer in gallons [liters] or to the nearest 0.001 ton [0.001 tonne]. Calibrate and adjust the system to maintain an accuracy of ± 1 percent error for each plant set-up before producing the mixture.

Provide an outage table or chart and measuring stick for each storage or working tank. Equip tanks with provisions to take asphalt binder material samples. After delivery of asphalt binder material to the

project, do not heat the material at temperatures greater than 350° F [175° C]. Do not store modified asphalt at temperatures greater than the manufacturer's recommendation.

B.1.f Dryer

The Department will not allow unburned fuel in the mix.

B.1.g Temperature Control

Equip the plant with enough temperature sensors to ensure temperature control of the aggregate and asphalt binder.

B.1.h Pollution 1717

B.2 Street Equipment

B.2.a Paver

Provide a paver capable of spreading and finishing to widths as shown on the plans and with an operational vibratory screed and automatic screed control to place mix without segregation.

Use an asphalt paver to place the mixture. When necessary, the Contractor may use a motor grader, when approved by the Engineer, to spread mixtures in areas that are inaccessible to a paver or when the quantity of mixture makes it impractical to place with a paver.

Use a shouldering machine to spread the mixture on shoulder surfacing and uniform width widening, when the placement width is too narrow for a paver.

Using a screed or strike-off assembly, produce a finished surface of the required evenness and texture without tearing, shoving, or gouging. For mainline paving, if the paving width is greater than the basic screed, auger and mainframe extensions, which meet manufacturer's recommendations for the paving width, are required unless otherwise directed by the Engineer. The Department will not allow strike-off only extension assemblies for mainline wearing course paving, unless the Engineer directs otherwise.

Equip all pavers with an approved automatic screed control. Sensor-operated devices need to include automatic controls that follow reference lines, or surfaces on one or both sides of the paver as required. Adjust the speed of the paver to produce the best results. A string line is only required if stated in the contract.

Spread all mixtures without segregation to the cross sections shown on the plans (excluding tight blade and scratch course applications). The objective on the leveling layer is to secure a smooth base of uniform grade and cross section so that subsequent courses will be uniform in thickness. The Contractor may spread the leveling layer with a properly equipped paver or, when approved by the Engineer, a motor grader equipped with a leveling device or with other means for controlling the surface elevation of the leveling layer.

Place each course over the full width of the section under construction on each day's run, unless the Engineer directs otherwise.

B.2.b Trucks

Provide trucks with tight, clean, and smooth truck haul beds. Do not allow mixture to adhere to the truck beds. When directed by the Engineer, provide a cover that extends at least 1 ft [300 mm] over the truck bed sides and attach to tie-downs, if the truck is not equipped with a mechanical or automated covering system.

B.2.c Motor Graders

Use a motor grader with the following characteristics:

- (1) Self-propelled,
- (2) Equipped with pneumatic tires with a tread depth of $\frac{1}{2}$ in [13 mm] or less,
- (3) Equipped with a moldboard blade that is at least 10 feet [3 m], and
- (4) With a wheelbase of at least 15 feet [4.5 m].

B.2.d Distributor

Provide a distributor capable of uniformly applying material up to 15 ft [4.6 m] wide and equipped with the following:

- (1) An accurate volume measuring device with tachometer,
- (2) Pressure gauges,
- (3) Thermometer for measuring temperatures of tank contents,
- (4) Power-operated pump, and
- (5) Full circulation spray bars with lateral and vertical adjustments.

B.2.e Rollers

Compact each lift of asphalt to the density require in 2360.3.D, "Compaction."

B.2.e(1) Steel-Wheeled Rollers

Self-propelled steel wheeled compacting equipment must weigh at least 8 ton [7.3 tonne]. If using vibratory rollers, provide rollers that produce 3,085 lbf per ft [45 kN per m] of width and a vibratory frequency of at least 2,400 vpm using the low amplitude setting. Provide a roller capable of reversing without backlash and equipped with spray attachments for moistening rollers on both sets of wheels.

B.2.e(2) Pneumatic Tired Rollers

Self-propelled pneumatic tired compacting equipment must have a compaction width of at least 5 ft [1.5 m] and a gross wheel load force of at least 3,000 lb [13 kN] per wheel for traffic level 2 and level 3 mixtures, 5,000 lb [22 kN] per wheel for traffic level 4 and level 5 mixtures, and, if using vibratory, at least 8 ton [7.3 tonne] total mass. Provide a roller with a tire arrangement that obtains full compaction over the full width with each pass of the roller.

B.2.e(3) Trench Rollers

Self-propelled trench rollers must weigh at least 2,960 lb per foot [4,400 kg per meter] of width.

B.3 Tack Coat

Apply an asphalt tack coat to the existing asphalt or concrete surfaces, and to the surface of each course or lift constructed, except for the final course or lift, in accordance with 2357. Allow emulsified asphalt tack coats to break, as indicated by a color change from brown to black, before placing subsequent lifts.

Apply the tack coat to contact surfaces of all fixed structures and the edge of the in-place mixture in all course at transverse joints and longitudinal joints.

C Joints

C.1 Construction Joints

Compact joints to produce a neat, tightly bonded joint that meets surface tolerances as described in 2360.3.E. Transverse and longitudinal joints are subject to the density requirement in accordance with 2360.3.D, "Compaction."

C.2 Transverse Joints

Construct a transverse joint, the full width of the paver, at right angles to the centerline when mixture placement operations are suspended. When work resumes, cut the end vertically for the full depth of the layer unless constructing a formed edge as approved by the Engineer.

C.3 Longitudinal Joint

Construct the longitudinal joint between strips and parallel to the pavement centerline. In multiple lift construction, construct the longitudinal joints between strips in each lift at least 6 in [150 mm] measured transversely from the longitudinal joints in the previously placed lift. If constructing a wearing course in an even number of strips, place one longitudinal joint on the centerline of the road. When constructing a wearing course in an odd number of strips, locate the centerline of one strip on the centerline of the road, provided that no joint is located in the wheel path area of a traffic lane. The Contractor will align longitudinal joints in multiple lift construction over portland cement concrete pavements directly over the concrete pavement longitudinal joints as approved by the Engineer.

At longitudinal joints formed by placing multiple strips, ensure the adjoining surface is higher but does not exceed $\frac{1}{8}$ in [3 mm], after final compaction of the previously placed strip. When constructing a strip adjoining a previously placed strip or a concrete pavement, remove to the longitudinal joint line, any fresh mixture that overlaps a previously placed strip or pavement before rolling.

D Compaction

After spreading each course, compact in accordance with the maximum density method as described in 2360.3.D.1, unless the ordinary compaction method is called for in the special provisions or as described in 2360.3.D.2, "Ordinary Compaction." Do not allow rollers to stand on the uncompacted mixture or newly rolled pavement with a surface temperature greater than 140 °F [60 °C]. Do not roll with steel-wheeled rollers if rolling produces aggregate that is crushed, cracked, or pulverized or causes displacement of the mixture.

To maintain a true surface, correct the following by removing and replacing the material in the defective areas as directed by the Engineer at no additional cost to the Department:

- (1) Variations such as depressions or high areas, which may develop during rolling operations; and
- (2) Lean, fat, or segregated areas.

When spreading mixtures with a motor grader, compact the mixture with pneumatic tired rollers simultaneously with the spreading operation.

D.1 Maximum Density

Compact the pavement to at least the minimum required maximum density values in accordance with Table 2360-19, "Required Minimum Lot Density (Mat)," and Table 2360-20, "Longitudinal Joint Density Requirement." Density evaluation will include compacted mat density and compacted longitudinal joint density. Density evaluation will not include longitudinal joint density on lifts with a 1 percent reduced density requirement.

Table 2360-19				
Required Minimum Lot Density (Mat)				
	SP Wear Mixtures* 	SP Non-Wear Mixtures* 	SP Shoulders* 	
			Designed at 3% Voids	Designed at 4% voids
% Gmm	92	93	93	92
* Reduce the minimum by 1 percent on the first lift constructed over PCC pavements. Reduce the minimum by 1 percent for the first lift constructed on aggregate base (mainline and shoulder), reclaimed or cold in place recycled base courses and first lift of an overlay on roadway with a spring load restriction no greater than 7 ton [6.35 tonne], including shoulders.				

Table 2360-20		
Longitudinal Joint Density Requirement		
Location	Confined Edge of Mat*	Unconfined Edge of Mat
Long joint wear and shoulder (4% air voids)	89.5	88.1
Long joint non-wear and shoulder (3% air voids)	90.5	89.1
* The Department defines "confined" as the edges of the placed mat abutting another mat, pavement surface, or curb and gutter. The Department defines "unconfined" or "unsupported" as no abutment on the side of the mat being placed with another mat or pavement surface.		

D.1.a Shoulders Greater Than 6 ft [1.8 m]

Unless otherwise shown on the plans or required by the special provisions, compact shoulders wider than 6 ft [1.8 m] paved using the maximum density method. When shoulders are compacted by the maximum density method and are paved separately from the driving lane, or have a different required minimum density than the driving lane, delineate the lot tonnage placed on the shoulder in separate lots from the driving lanes for the day paving was conducted.

D.1.b Shoulders Equal to or Less Than 6 ft [1.8 m]

Unless otherwise shown on the plans or required by the special provisions, use the ordinary compaction method in accordance with 2360.3.D.2 to compact a narrow shoulder no wider than 6 ft [1.8 m] paved in the same pass as a driving lane or paved separately. The Department will exclude mixture compacted under ordinary compaction from lot density requirements and from incentive or disincentive payment.

When compacting a narrow shoulder using the maximum density method, compact to densities in accordance with Table 2360-19. If the minimum required density of the shoulder is different than the driving lane, delineate the tonnage placed on the shoulder in separate lots from the driving lane.

D.1.c Echelon Paving

The Department considers echelon paving, two pavers running next to each other in adjacent lanes, as separate operations.

D.1.d Determination

Calculate each individual lot's maximum density by averaging the results of the cores within the lot expressed as the percentage of the maximum specific gravity. Test fine graded mix in accordance with Laboratory Manual Method 1810. Test coarse graded mix in accordance with Laboratory Manual Method 1816 when directed by the Engineer. Determination of coarse or fine graded mixtures is based on the percentage of material passing the No. 8 [2.36 mm] sieve as defined in Table 2360-8.

Obtain the maximum specific gravity value for calculating the percentage density for the lot from the maximum gravity values taken from production tests during that day's paving. If the production tests during that day's paving result in only one or two maximum specific gravity values, use the moving average value at that test point. If production tests during that day's paving result in three or more maximum specific gravity values, use the average of those tests alone as indicated above.

D.1.e Timeline

Complete compaction within 8 h of mixture placement and before obtaining core samples. Only use pneumatic tired or static steel rollers for compaction performed between 6 h and 8 h after mixture placement. Do not reroll compacted mixtures with deficient densities.

D.1.f Stop Production

If all the lots in a day's production or greater than 50 percent of the lots on multiple days fail to meet the minimum density requirement, stop production, determine the source of the problem, and take corrective action to bring the work into compliance with specified minimum required density.

D.1.g Lot Determination

Table 2360-21 Lot Determination	
Daily Production, ton [tonne]	Lots
300* – 600 [270* – 545]	1
601 – 1,000 [546 – 910]	2
1,001 – 1,600 [911 – 1,455]	3
1,601 – 2,600 [1,456 – 2,360]	4
2,601 – 4,600 [2,361 – 4,175]	5
> 4,600 [4,175]	
* If producing no greater than 300 ton [270 tonne] of mix, establish the first lot when the total weight is greater than 300 ton [270 tonne].	
Add one lot for each additional 900 tons [820 tonne] or part thereof.	

D.1.h Mat Density Cores

Obtain four cores in each lot. Take two cores from random locations as directed by the Engineer. Take the third and fourth cores, the companion cores, within 1 ft [0.3 m] longitudinally from the first two cores. Submit the companion cores to the Engineer immediately after coring and sawing. If the random core location falls on a longitudinal joint, cut the core with the outer edge of the core barrel 1 ft [0.3 m] away laterally from the edge of the top of the mat. Do not take cores for compacted mat density within 1 ft [300 mm] of any longitudinal joint. The Contractor is responsible for maintaining traffic, coring, patching the core holes, and sawing the cores to the paved lift thickness before density testing.

The Engineer may require additional density lots to isolate areas affected by equipment malfunction, heavy rain, or other factors affecting normal compaction operations.

D.1.i Contractor Core Testing

Take and test cores at least 4 in [100 mm] in diameter at locations determined and marked by the Engineer.

Mark samples with the lot number and core number or letter. Transport the cores to the laboratory daily taking care to prevent damage to them. Schedule the approximate time of testing during normal project work hours to allow the Engineer to observe the test and to record the saturated surface dry and immersed weight of the cores.

Determine the density by the end of the next working day after compaction. Measure each core three times for thickness before saw cutting. Report the average lift thickness on the core sheet. If placing multiple layers in a single day, saw and separate cores for each layer, test, and report by the end of the next working day. Place and compact mix into the coring hole to restore the surface within 24 h after coring or the Department will fine the Contractor \$100 per working day per lot until restored.

D.1.j Companion Core Testing

The Department will select at least one of the two companion cores per lot to test for verification. For lots designated as longitudinal joint density lots, the Department will test at least one of the mat density companion cores and at least one of the longitudinal joint density companion cores.

D.1.k Tolerance Comparison

D.1.k(1) Tolerance Comparison – Individual

Compare the individual core bulk specific gravities obtained by the Contractor and by the Department. If the bulk specific gravity between the Contractor and the Department cores differ by more than 0.030, use the Department's bulk specific gravity.

D.1.k(2) Tolerance Comparison – Day's Shrinking Tolerance

For a second comparison of the cores that pass the individual tolerance criteria, compare the average of the Contractor's bulk specific gravities with the average of the Department's bulk specific gravities. Determine the tolerance by dividing 0.030 by the square root of the number of samples compared. Use all the Department's results for the day's paving if the cores do not fall within the determined tolerance.

D.1.l Recoring

The Engineer may allow the Contractor to re-core a sample if the sample was damaged in the coring process or damaged in transit to the laboratory through no fault of the Contractor.

D.1.m One Percent Reduced Density

The Department will exclude incentive payments for reduced minimum density in accordance with Table 2360-19, "Required Minimum Lot Density (Mat)." The Contractor may request the Engineer to waive the reduced density requirement and reevaluate the density in accordance with Table 2360-19, "Required Minimum Lot Density (Mat)," including incentives, for all cases except the first lift constructed over concrete pavement. Make the request and obtain approval from the Engineer after the first day's paving and by the end of the third day of paving. If the Engineer approves the request, the normal maximum density will remain in effect for the duration of mixture placement on that lift. The Contractor shall comply with any construction requirements on subsequent lifts.

D.1.n Longitudinal Joint Density

Evaluate longitudinal joint density in one lot per day unless the total daily weight is greater than 5,000 ton [5,000 tonne]. If the total daily weight is greater than 5,000 ton [5,000 tonne], evaluate two lots per day. Randomly select the location to take cores for longitudinal joint density from the mat density core locations. Take six cores at this location. Take cores for longitudinal joint density with the outer edge of the core barrel within 6 in [150 mm] from the edge of the top of the mat for both sides of the mat. Take a companion core 1 ft [0.3 m] longitudinally from each core. Take two cores for mat density at either 2 ft [0.61 m] right or 2 ft [0.61 m] left of the center of the mat the Contractor is paving, regardless of random number generation.

D.1.o Imaginary Joint

An actual longitudinal joint will not exist if pulling the shoulder and driving lane in the same paving pass. Do not cut a core on the imaginary line where a joint would have existed had the shoulder and the drive lane been paved separately.

D.1.p Shoulders

D.1.p(1) Shoulder – Ordinary Compaction

If compacting the shoulder under the ordinary density specification, do not take longitudinal joint cores in shoulders. Core at the centerline longitudinal edge cores (6 in [150 mm] from the joint) and at the mat density cores (2 ft [0.61 m] right or left of the center of the paving pass).

D.1.p(2) Shoulder-Maximum Density Specification

Core at the following locations:

- (1) Centerline longitudinal edge cores (6 in [150 mm] from the joint),
- (2) Mat density cores (2 ft [0.61 m] right or left of the center of the paving pass), and
- (3) Edge of the shoulder (6 in [150 mm] from the outside edge).

Do not cut cores on the imaginary line at the edge of the shoulder adjacent to the driving lane. Move coring locations on imaginary lines to 6 in [150 mm] inside the edge of the shoulder.

D.1.q Payment Schedule

Table 2360-22			
Payment Schedule for Maximum Mat Density			
SP Wear and SP Shoulders (4% Void) Density, %*	SP Non-Wear and SP Shoulders (3% Void), Density, %*	Mat Density Pay Factor A	
		Traffic Level 2 & 3	Traffic Level 4 & 5
≥ 93.6	≥ 94.6	1.03	1.05
93.1 – 93.5	94.1 – 94.5	1.02	1.04
92.0 – 93.0	93.0 – 94.0	1.00	1.00
91.0 – 91.9	92.0 – 92.9	0.98	0.98
90.5 – 90.9	91.5 – 91.9	0.95	0.95
90.0 – 90.4	91.0 – 91.4	0.91	0.91
89.5 – 89.9	90.5 – 90.9	0.85	0.85
89.0 – 89.4	90.0 – 90.4	0.70	0.70
< 89.0	< 90.0	†	†

* Calculate the percent of maximum specific gravity to the nearest tenth.

|| Payment will only apply if the day's weighted average individual production air voids fall within - ½ percent of the target air void value. Base the weighted average air voids on all the mixture production tests in accordance with 2360.2.G.7, "Production Tests" for the corresponding day and weight by the tons the corresponding test represents.

† The Department will pay for the mixture represented by the lot at 70 percent of the relevant contract unit price, unless a single core density is less than 87.0 percent of the maximum specific gravity (G_{mm}). If a single core density is less than 87.0 percent of G_{mm} , the Engineer will decide if the mixture is subject to removal and replacement or reduced payment at 50 percent of the relevant contract unit price. If the Engineer decides the material needs to be removed and replace, the Contractor will remove and replace the material at no additional cost to the Department. Use additional core samples to determine the limits of the removal and replacement area. Take additional core samples at the same offset from centerline as the original core. If the original low density core was taken within 1½ ft [0.45 m] of an edge of the paver pass, take additional cores at 1½ ft [0.45 m] from the edge of the paver pass. Determine the densities at 50 ft [15 m] intervals both ahead and behind the point of unacceptable core density until finding a point of acceptable core density. If the incremental core density testing extends into a previously accepted lot, remove the unacceptable material. Do not use to the test results to recalculate the previously accepted lot density. Perform additional coring and testing for unacceptable core density at no additional cost to the Department. The Department will calculate the area of unacceptable pavement as the product of the longitudinal limits as determined by the 50 ft [15 m] cores and the full width of the paver pass, laying in the traffic lane or lanes. The Department will exempt shoulders from this calculation unless density failure occurred in the shoulder area. After removing and replacing the unacceptable material, determine the density of the replacement material by averaging the two cores. The Department will pay for the replacement material in accordance with Table 2360-22 or Table 2360-23. The Department will not pay for material removed. The Department will pay for the remainder of the original lot at 70 percent of the relevant contract unit price.

Table 2360-23*		
1 Percent Reduced Table		
SP Wear and SP Shld (4% Void) Maximum Specific Gravity, % 	SP Non-Wear, and SP Shld (3% Void), Maximum Specific Gravity, % 	Payment, %
≥ 91.0	≥ 92.0	100
90.0 – 90.9	91.0 – 91.9	98
89.7 – 89.9	90.5 – 90.9	95
89.4 – 89.6	90.0 – 90.4	91
89.2 – 89.3	89.5 – 89.9	85
89.0 – 89.1	89.0 – 89.4	70
< 89.0†	< 89.0	†

* Reduce the minimum by 1 percent for the first lift constructed on aggregate base (mainline and shoulder), reclaimed or cold in-place recycled base courses and first lift of an overlay on a roadway with a spring load restriction (including shoulders) no greater than 7 ton [6.35 tonne]. Reduce the minimum by 1 percent on the first lift constructed on PCC pavements (reduced density cannot be waived on PCC).

|| Calculate the percent of maximum specific gravity to the nearest tenth.

† The Department will pay for the mixture represented by the lot at 70 percent of the relevant contract unit price, unless a single core density is less than 87.0 percent of the maximum specific gravity (G_{mm}). If a single core density is less than 87.0 percent of G_{mm} , the Engineer will decide if the mixture is subject to removal and replacement or reduced payment at 50 percent of the relevant contract unit price. If the Engineer decides the material needs to be removed and replaced, the Contractor will remove and replace the material at no additional cost to the Department. Use additional core samples to determine the limits of the removal and replacement area. Take additional core samples at the same offset from centerline as the original core. If the original low density core was taken within 1½ ft [0.45 m] of an edge of the paver pass, take additional cores at 1½ ft [0.45 m] from the edge of the paver pass. Determine the densities at 50 ft [15 m] intervals both ahead and behind the point of unacceptable core density until finding a point of acceptable core density. If the incremental core density testing extends into a previously accepted lot, remove the unacceptable material. Do not use the test results to recalculate the previously accepted lot density. Perform additional coring and testing for unacceptable core density at no additional cost to the Department. The Department will calculate the area of unacceptable pavement as the product of the longitudinal limits as determined by the 50 ft [15 m] cores and the full width of the paver pass, laying in the traffic lane or lanes. The Department will exempt shoulders from this calculation unless density failure occurred in the shoulder area.

After removing and replacing the unacceptable material, determine the density of the replacement material by averaging the two cores. The Department will pay for the replacement material in accordance with Table 2360-22 or Table 2360-23. The Department will not pay for material removed. The Department will pay for the remainder of the original lot at 70 percent of the relevant contract unit price.

Table 2360-24* Payment Schedule for Longitudinal Joint Density (SP Non-wear and SP Shoulders, 4% Void)					
Longitudinal Joint (Confined Edge) Density, % 	Pay Factor B Longitudinal (Confined Edge)		Longitudinal Joint (Unsupported Edge) Density, % 	Pay Factor C (Unsupported Edge)	
	Traffic Level 2 & 3	Traffic Level 4 & 5		Traffic Level 2 & 3	Traffic Level 4 & 5
≥ 92.1	1.02†	1.03†	≥ 91.0	1.02†	1.03†
91.6 – 92.0	1.01†	1.02†	90.1 – 90.9	1.01†	1.02†
89.5 – 91.5	1.00	1.00	88.1 – 90.0	1.00	1.00
88.5 – 89.4	0.98	0.98	87.0 – 88.0	0.98	0.98
87.7 – 88.4	0.95	0.95	86.0 – 86.9	0.95	0.95
87.0 – 87.6	0.91	0.91	85.0 – 85.9	0.91	0.91
< 87.0	0.85	0.85	< 85.0	0.85	0.85
* The Department will limit incentive payment for longitudinal joint density to lots with evaluated longitudinal joint densities. Calculate the percent of maximum specific gravity to the nearest tenth. † Payment will only apply if the day's weighted average individual production air voids fall within - ½ percent of the target air void value. Base the weighted average air voids on all the mixture production tests in accordance with 2360.2.G.7, "Production Tests" for the corresponding day and weight by the tons the corresponding test represents.					

Table 2360-25* Payment Schedule for Longitudinal Joint Density (SP Non-wear and SP Shoulders, 3% Void)					
Longitudinal Joint (Confined Edge) Density, % 	Pay Factor B Longitudinal (Confined Edge)		Longitudinal Joint (Unsupported Edge) Density, % 	Pay Factor C (Unsupported Edge)	
	Traffic Level 2 & 3	Traffic Level 4 & 5		Traffic Level 2 & 3	Traffic Level 4 & 5
≥ 93.1	1.02†	1.03†	≥ 92.0	1.02†	1.03†
92.6 – 93.0	1.01†	1.02†	91.1 – 91.9	1.01†	1.02†
90.5 – 92.5	1.00	1.00	89.1 – 91.0	1.00	1.00
89.5 – 90.4	0.98	0.98	88.0 – 89.0	0.98	0.98
88.7 – 89.4	0.95	0.95	87.0 – 87.9	0.95	0.95
88.0 – 88.6	0.91	0.91	86.0 – 86.9	0.91	0.91
< 88.5	0.85	0.85	< 86.0	0.70	0.85
* The Department will limit incentive payment for longitudinal joint density to lots with evaluated longitudinal joint densities. Calculate the percent of maximum specific gravity to the nearest tenth. † Payment will only apply if the day's weighted average individual production air voids fall within ½ percent of the target air void value. Base the weighted average air voids on all the mixture production tests in accordance with 2360.2.G.7, "Production Test" for the corresponding day and weight by the tons the corresponding test represents.					

D.1.r Pay Factor Determination

Determine the pay factor in accordance with the following:

- (1) Case 1: Total Pay Factor = (Pay Factor A) × (Pay Factor B) × (Pay Factor C)
- (2) Case 2: Total Pay Factor = (Pay Factor A) × (Pay Factor B) × (Pay Factor B)
- (3) Case 3: Total Pay Factor = (Pay Factor A) × (Pay Factor C) × (Pay Factor C)

Where:

Pay Factor A = Mat density,
Pay Factor B = Confined edge density,
Pay Factor C = Unsupported edge density.

Use a pay factor of 1.00 for Pay Factor B, Pay Factor C, or both in lots where no cores are taken at the longitudinal joint.

D.2 Ordinary Compaction

Perform ordinary compaction for the following:

- (1) Layers identified in the typical sections with a minimum planned thickness less than 1½ in [40 mm],
- (2) Thin lift leveling,
- (3) Wedging layers,
- (4) Patching layers,
- (5) Driveways, and
- (6) Areas the Contractor cannot compact with standard highway construction equipment.

If using the ordinary compaction method to evaluate density, use a control strip to establish a rolling pattern. Use the rolling pattern to compact the asphalt mixture for the layer on which the control strip is constructed or until constructing a new control strip. The Engineer may waive the control strip requirement in small localized areas or other areas not conducive to its establishment.

D.2.a Control Strip

Construct a control strip at least 395 sq. yd [330 sq. m] and of the same thickness as the lift the control strip represents at the beginning of the work on each lift of each course. Begin compacting immediately after spreading the mixture. Continue compacting until additional roller coverage does not produce appreciable increase in density. Determine densities by means of a portable nuclear testing device or approved alternate and create a growth curve to determine the optimum rolling pattern. Provide documentation of the growth curve to the Engineer. Roll the remainder of that course in accordance with the pattern developed in the test strip for that roller. Provide a new control strip in accordance with the following:

- (1) If using a new JMF with a proportion change greater than 10 percent when compared to the currently produced mixture for a single stockpile aggregate,
- (2) If changing the source of either aggregate or binder, or
- (3) After 10 days of production.

D.2.b Equipment

Use rollers that meet the requirements in 2360.3.B.2.e. Use the same equipment type and weight on the remainder of the pavement course that was used to construct the control strip. Provide at least two rollers. Provide a tandem steel wheeled roller for final rolling. The Contractor may use trench rollers or mechanical tampers to compact areas inaccessible to the conventional type rolling equipment.

D.2.c Mixture Temperature

Refer to Table 2360-26, "Minimum Temperature Control" for the minimum laydown temperatures in all courses of the asphalt mixture as measured behind the paver or spreading machine. Do not pave when the air temperature is less than 32° F [0° C] unless otherwise directed by the Engineer in writing.

Table 2360-26*				
Minimum Temperature Control				
Air Temperature, °F [°C]	Compacted Mat Thickness, †			
	1 in [25 mm]	1½ in [40 mm]	2 in [50 mm]	≥3 in [75 mm]
32 – 40 [0-5]	—	265 [129]	255 [124]	250 [121]
41 – 50 [6-10]	270 [130]	260 [127]	250 [121]	245 [118]
51 – 60 [11-15]	260 [127]	255 [124]	245 [118]	240 [115]
61 – 70 [16-21]	250 [121]	245 [118]	240 [115]	235 [113]
71 – 80 [22-27]	245 [118]	240 [115]	235 [113]	235 [113]
81 – 90 [28-32]	235 [113]	230 [110]	230 [110]	230 [110]
≥ 91 [33]	230 [110]	230 [110]	230 [110]	225 [107]
* Not applicable if using a Warm Mix Asphalt (WMA) additive or process				
Use at least one pneumatic-tire roller for intermediate rolling unless otherwise directed by the Engineer. The Engineer may specify or modify the minimum laydown temperature in writing.				
† Based on the lift thicknesses shown on the plans.				

E Surface Requirements

After compaction, the finished surface of each lift shall be reasonably free of segregated, open and torn sections, and shall be smooth and true to the grade and cross section shown on the plans with the following tolerances:

Table 2360-26		
Surface Requirements		
Course/Location	Description	Tolerance
Leveling/1 st lift using automatics	Tolerance also applies to 1 st lift placed other than leveling when automatics are used.	½ in [15 mm]
Wear	Tolerance of final 2 lifts from the edge of a 10 foot [3 m] straightedge laid parallel to or at right angles to the centerline.	¼ in [6 mm]
Shoulder Wear, Temporary Wear & bypasses	Tolerance from the edge of a 10 foot [3 m] straightedge laid parallel to or at right angles to the centerline.	¼ in [6 mm]
Transverse joints/construction joints	Tolerance from the edge of a 10 foot [3 m] straightedge centered longitudinally across the transverse joint. Correction by diamond grinding required when directed by the Engineer.	¼ in [6 mm]
Transverse Slope	Tolerance for surface of each lift exclusive of final shoulder wear.	Not to vary by more than 0.4 % from plans.
Distance from edge of each lift and established centerline.	No less than the plan distance or more than 3 inches [75 mm] greater than the plan distance. The edge alignment of the wearing lift on tangent sections and on curve sections of 3 degrees or less can't deviate from the established alignment by more than 1 inch [25 mm] in any 25 foot [7.5 m] section.	See Description
Final wear adjacent to concrete pavements.	After compaction the final lift wear adjacent to concrete pavements must be slightly higher but not to exceed 1/4" [6mm] than the concrete surface.	See Description
Final wear adjacent to fixed structures.	After compaction the final lift wear adjacent to gutters, manholes, pavement headers, or other fixed structures must be slightly higher but not to exceed 1/4" [6mm] than the surface of the structure.	See Description
Finished surface of each lift.*	Must be free of segregated and open and torn sections and deleterious material. *Excluding tight blade and scratch courses.	See Description

Cut or saw and then remove and replace material placed outside the described limitations at no additional cost to the Department. If the Engineer determines the material can remain in place outside the limits, the Department will pay for the material at a reduced cost of \$10 per sq. yd [\$12 per sq. m]. The Department will consider any single occurrence of material outside the limitations to have a minimum dimension of at least 1 sq. yd [1 sq. m] in any dimension.

In addition to the list the above the pavement surface must meet requirements of 2399 (Pavement Surface Smoothness) requirements.

E.1 Lift Thickness

After compaction, the thickness of each lift shall be within a tolerance of $\frac{1}{4}$ in [6 mm] of the thickness shown on the plans, except that, if automatic grade controls are used, this thickness requirement will not apply to the first lift placed. This thickness requirement will not apply to a leveling lift whether or not automatic grade controls are required. The Engineer may require removal and replacement of any part of any lift that is constructed to less than the minimum required thickness, at no additional cost to the Department.

Measure cores taken for density determination for thickness also. Measure each core three times for thickness before sawing. Report the average of these three measurements. Document each lot's average core thickness and submit to the Engineer. If the average of the two Contractor cores exceed the specified tolerance, an additional two cores may be taken in the lot in question. The Engineer will use the average of all core thickness measurements per day per lift to determine daily compliance with thickness specifications.

On that portion of any lift constructed to more than the maximum permissible thickness, the materials used in the excess mixture above that required to construct that portion of the lift to the plan thickness plus $\frac{1}{4}$ in [6 mm] may be excluded from the pay quantities or at the discretion of the Engineer and at the Contractor's expense may be required to be removed and replaced.

F Asphalt Mixture Production (FOB Department Trucks)

Produce asphalt mixture for the Department. Load the mixture being produced onto Department furnished trucks at the mixing plant at a time agreed on by the Engineer and Contractor. The Engineer will notify the Contractor of the total quantity of mixture required not less than 2 weeks prior to completion of the final wearing course. The Engineer will not accept the asphalt mixture if it is unsuitable for the intended use.

G Small Quantity Paving

A MDR is not required for planned project quantities less than 9,000 sq. yd inches (4,500 sq. yd per 2-inch thickness, etc) [191,200 m² mm] or 500 ton [450 tonne]. Verify in writing that the asphalt mixture delivered to the project meets the requirements of Table 3139-3 and Table 2360-7, "Mixture Requirements." The Department will obtain samples, as determined by the Engineer, to verify mixture requirements and to perform material acceptance in accordance with 2360.2.G.14.b, "Isolated Failures at Mixture Start-Up — Production Air Voids," 2360.2 G.14.c, "Individual Failure — Gradation, Percent Asphalt Binder, Production Air Voids, and Adj. AFT," and 2360.2.G.14.h, "Coarse and Fine Aggregate Crushing Failure."

2360.4 METHOD OF MEASUREMENT

When paying for material by weight, the Engineer will measure separately asphalt mixture of each type by weight based on the total quantity of material hauled from the mixing plant. The Engineer will not make deductions for the asphalt materials.

When paying for material by area, the Engineer will separately measure asphalt mixture of each type and for each specific lift by area and by thickness on the basis of actual final dimensions placed.

2360.5 BASIS OF PAYMENT

The contract unit price for asphalt mixture used in each course includes the cost of constructing the asphalt surfacing and providing and incorporating asphalt binder, mineral filler, hydrated lime. Anti-stripping additives may be permitted or required as indicated in 2360.2.C.

The Department will pay for additives required by the contract at the relevant contract unit price for the mixture. The Department will pay for additives incorporated as directed by the Engineer as extra work in accordance with 1403, "Extra Work."

The Department will apply reduced payment if the mixture includes steel slag as one of the aggregate proportions and the production lab density at the design gyrations at the recommended or established asphalt content is greater than 160 lb per cu. ft [2,565 kg per cu. m]. The Department will pay for the mixture at the contract unit price, calculated as follows:

$$\%Payment = \frac{100 - (100 \times (\text{production density at design gyrations} - 160))}{160}$$

$$\left[\%Payment = \frac{100 - (100 \times (\text{production density at design gyrations} - 2,565))}{2,565} \right]$$

If the plans do not show a contract pay item for shoulder surfacing and other special construction, the Department will include payment for the quantities of material used for these purposes in the payment for the wearing course materials.

Complete yield checks and monitor thickness determinations to construct the work as shown on the plans. Use the tolerances for lift thickness in accordance with 2360.3.E, "Surface Requirements" and surface smoothness requirements in accordance with 2399 for occasional variations and not for continuous over-running or under-running, unless otherwise required by the Engineer.

The contract unit price for asphalt mixture production includes the cost of the material and loading onto Department-provided trucks at the mixing plant.

The Department will pay for plant mixed asphalt pavement on the basis of the following schedule:

Item No.:	Item:	Unit:
2360.501	Type SP* Wearing Course Mixture ††	ton [metric ton]
2360.502	Type SP* Non-Wearing Course Mixture ††	ton [metric ton]
2360.503	Type SP* Course Mixture ††# in [mm] thick,	square yard [square meter]
2360.504	Type SP* Course Mixture ††	square yard [square meter]
2360.505	Type SP * Bituminous Mixture for Specified Purpose	ton [metric ton]
2360.506	Type SP * Bituminous Mixture Production	ton [metric ton]
*	Aggregate size Designation, 9.5, 12.5 or 19 as appropriate, see 2360.1.A.3.	
	"Wearing" or "Non Wearing" as appropriate.	
†	Traffic level in accordance with Table 2360-1, "Traffic Levels."	
‡	AC binder grade designation (Table 2360-2).	
#	Lift thickness shown on the plans.	

DISADVANTAGED BUSINESS ENTERPRISE (DBE) SPECIAL PROVISIONS

PURPOSE

These provisions (1) provide an explanation of the federal law and information regarding compliance with the DBE requirements applicable to this contract, (2) explain the process Mn/DOT will follow to evaluate bidders' efforts to obtain DBE participation, (3) provide the standards Mn/DOT will use to measure compliance with these requirements, and (4) identifies sanctions.

POLICY STATEMENT

It is the policy of the Minnesota Department of Transportation (Mn/DOT) that DBEs, as defined in 49 C.F.R. § 26, shall have the maximum feasible opportunity to participate in contracts financed in whole or in part with public funds provided by the U.S. Department of Transportation (DOT). Consistent with this policy, Mn/DOT will not allow any person or business to be excluded from participation in, denied the benefits of, or to otherwise be discriminated against in connection with the award and performance of any DOT-assisted contract because of sex, color, race, or national origin. Mn/DOT has established a Disadvantaged Business Enterprise Program in accordance with regulations of the DOT, 49 C.F.R. § 26.

Mn/DOT has received federal financial assistance from DOT for this contract, therefore the DBE requirements of 49 C.F.R. § 26 apply to this contract. As a condition of receiving this assistance, Mn/DOT has provided assurance it will comply with the 49 C.F.R. § 26. This regulation requires that contractors take necessary and reasonable steps to ensure that DBEs have the maximum opportunity to compete for and perform this contract. These special provisions provide detailed information about these requirements, and identify the responsibility the contractor has to demonstrate compliance with the requirements.

CONTRACT ASSURANCE

The contractor, and its subcontractor(s), shall not discriminate on the basis of sex, color, race or national origin in the performance of this contract. The contractor agrees to act in accordance with applicable requirements of 49 C.F.R. § 26 in the execution and award of this contract. Failure by the contractor to comply with these requirements is a material breach of this contract, which may result in the termination of this contract or other such remedy as Mn/DOT deems appropriate.

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BASIC REQUIREMENT

In order to be awarded this contract, the Apparent Low Bidder (ALB) must establish either (1) that it has met the DBE participation goal of the contract; or (2) that it has made adequate good faith efforts (GFE) to meet the DBE goal. This requirement is in addition to all other pre-award requirements.

DBE GOAL OF THIS CONTRACT

The DBE goal on this contract is 6.0 percent.

METHODS TO ATTAIN THE GOAL

The goal may be attained by:

1. Subcontracting with a DBE certified by the Minnesota Unified Certification Program (Mn/UCP). To prove the existence of such a subcontract, the Apparent Low Bidder (ALB) shall submit a signed agreement or a signed affidavit committing it to enter into such a subcontract;
2. Leasing equipment from a Mn/UCP-certified DBE;
3. Entering into a joint venture with a Mn/UCP-certified DBE. This joint venture must be approved in writing by the Mn/DOT Office of Civil Rights prior to bid opening;
4. Purchasing materials and supplies from a Mn/UCP-certified DBE. Generally, sixty percent (60%) of the supplier's contracted amount will be credited toward the DBE goal; however 100% of the amount will be credited towards the DBE goal if the supplies or materials are obtained from a Mn/UCP -certified DBE manufacturer; or
5. Using other services as approved in writing by the Mn/DOT Office of Civil Rights prior to bid opening.

SOLICITING DBEs

All bidders should make every reasonable effort to subcontract work to DBEs through good faith negotiations and solicitations in advance of the dates specified for submitting and opening of bids.

In order to fulfill a DBE goal, the firms utilized as DBE subcontractors or suppliers must be certified as DBEs by the Mn/UCP **prior to the date of the bid opening**. The Mn/UCP DBE directory, which is found on Mn/DOT's Office of Civil Rights website, includes the names and addresses of all certified DBE firms. To be listed in the DBE directory, a DBE needs only to be

certified as a DBE by the Mn/UCP. Neither Mn/DOT nor the Mn/UCP makes any representation as to any DBE's technical or financial ability to perform the work. Prime contractors are solely responsible for performing due diligence in hiring DBE subcontractors. A DBE subcontractor's failure to perform the work will not be considered justification for a compensation increase.

APPARENT LOW BIDDER (ALB) SUBMITTAL OF INFORMATION

The ALB must identify the efforts it made to meet the DBE goal. The ALB must submit the information described in this section to the Mn/DOT Office of Civil Rights. All bidders are required to thoroughly document these solicitation efforts. The ALB shall justify any bids, quotes, or proposals it rejects from properly certified, qualified DBE firms.

THE FOLLOWING INFORMATION MUST BE SUBMITTED ON THE SUBMISSION DUE DATE. The Submission Due Date is the fifth business day after the bid letting date, unless the Mn/DOT Director of the Office of Civil Rights grants a written extension for good cause shown. The five day period starts the business day following the bid letting date. Information sent by fax or personal delivery must be received by the Mn/DOT Office of Civil Rights no later than 4:30PM central time on the Submission Due Date. Information sent by U.S. mail must be postmarked no later than the Submission Due Date. FAILURE TO SUBMIT ALL REQUIRED INFORMATION WITHIN THE ALLOWED FIVE BUSINESS DAY PERIOD WILL RESULT IN REJECTION OF YOUR BID ON THE BASIS THAT YOU ARE NOT A RESPONSIBLE BIDDER. PARTIAL SUBMISSIONS WILL NOT BE CONSIDERED.

The ALB must either (1) identify DBE participation sufficient to meet the DBE goal; or (2) demonstrate that the ALB made adequate good faith efforts to meet the DBE goal. The ALB must submit the following documents to the Mn/DOT Office of Civil Rights:

1. Certificate of Good Faith Efforts Consolidated Form (GFE Consolidated Form)
2. DBE Description of Work and Field Monitoring Report (Exhibit A)
3. Supporting Documentation to Verify Good Faith Efforts

The ALB must complete and submit the attached **Certificate of Good Faith Efforts Consolidated Form** as stated in the form instructions.

Part A - The ALB must provide contact information.

Part B - The ALB must provide project information including the DBE goal and the amount of DBE commitment the ALB obtained.

Part C - The ALB must provide information stating the amount of self-performance and DBE and non-DBE subcontractors' participation in this contract.

Part D - The ALB must list each subcontractor it **solicited**. The information must include all DBE and non-DBE firms (including all subcontractors, service providers and suppliers) from whom the ALB solicited quotes to provide work and supplies for this contract. Part D must be completed only if the ALB did not obtain sufficient DBE participation to meet the DBE goal.

Part E - The ALB must list the DBE firms that it intends to use on this contract and

- provide an Exhibit A form and quote.
- Part F - The ALB must list all non-DBE firms that provided a quote and indicate whether the non-DBE quote was accepted.
- Part G - The ALB must list DBE firms that provided a quote but were not selected. Part G must be completed only if the ALB did not obtain sufficient DBE participation to meet the DBE goal.
- Part H - The ALB must complete this **Good Faith Efforts Affidavit** regardless of whether the ALB's list of proposed subcontractors, service providers, and suppliers shows sufficient DBE participation to meet the DBE goal set for this contract.

The ALB must submit **DBE Description of Work and Field Monitoring Report (Exhibit A)**. A separate form must be submitted for each DBE firm the ALB proposes to utilize on the project. This must *be accompanied by proof of commitment to use the DBE firms*, such as copies of signed agreements, affidavits, or letters of intent. These commitments will be used to determine the "commitment rate" (the percentage of DBE participation). The ALB must commit to using the proposed DBE firms for not less than the percentage of the DBE participation shown on the DBE Description of Work and Field Monitoring Report (Exhibit A). An ALB will be deemed a non-responsible bidder if it fails to include in its submission a completed DBE Description of Work and Field Monitoring Report (Exhibit A) for each DBE along with the required signed agreements or affidavits.

The ALB must submit information that demonstrates its adequate good faith efforts to achieve the DBE goal. This information can include, but is not limited to, copies of solicitation letters, faxes, and emails to DBE firms. The ALB must identify the actions it took to achieve the DBE goal, including those actions listed in 49 C.F.R. § 26 Appendix A.

FAILURE TO SUBMIT INFORMATION

If the ALB fails to submit the information required by the previous section the ALB is a non-responsible bidder and Mn/DOT will reject the ALB's bid. **All required information must be submitted by the Submission Due Date.** The information submitted shall state the ALB's commitment to use DBEs for not less than the commitment rate.

IF THE DBE GOAL IS NOT MET, A GOOD FAITH EFFORTS REVIEW WILL BE CONDUCTED

An ALB that does not commit to meeting the DBE goal is thereby not disqualified if the ALB demonstrates that it made adequate good faith efforts (GFE) to meet the DBE goal. An ALB that does not commit to meet the DBE goal and fails to show adequate GFE were made is a non-responsible bidder and Mn/DOT will reject its bid. See 49 C.F.R. § 26.53(a)(2).

A DBE firm that bids as a prime contractor will be deemed to have met the DBE goal if the value of the work performed by its own forces, combined with any work that it has committed to be performed by DBE subcontractors and DBE suppliers, meets or exceeds the DBE goal. See 49 C.F.R. § 26.53(g).

In addition to the GFE activities listed in the following section, Mn/DOT may, as permitted by the Federal regulations, take into account the performance of other bidders in meeting the DBE contract goal. See 49 C.F.R. § 26 Appendix A(V).

EVALUATION OF GOOD FAITH EFFORTS

If an ALB has a DBE commitment rate that is below the DBE goal, then the ALB must demonstrate that it made adequate good faith efforts in attempting to meet the DBE goal. Mn/DOT's Office of Civil Rights (OCR) staff will review the GFE documents submitted by the ALB and the DBE commitment submitted by each bidder to evaluate the ALB's commitment rate.

The ALB must show that it took all necessary and reasonable steps to achieve the DBE goal which, by their scope, intensity, and appropriateness to the objective, could reasonably be expected to obtain sufficient DBE participation, even if they were not fully successful. In evaluating the ALB's adequate good faith efforts, Mn/DOT will consider the following list of actions. This is not a mandatory checklist, nor is it intended to be exclusive or exhaustive. Other factors or types of efforts may be relevant in appropriate cases. Compliance with the adequate good faith efforts requirement will be determined on a case-by-case basis.

- A. Soliciting through all reasonable and available means (e.g. attendance at pre-bid meetings, advertising and /or written notices) the interest of all certified DBEs who have the capability to perform the work of the contract. The ALB must solicit this interest within sufficient time to allow the DBEs to respond to the solicitation. The bidder must determine with certainty if the DBEs are interested by taking appropriate steps to follow up initial solicitations.
- B. Selecting portions of the work to be performed by DBEs in order to increase the likelihood that the DBE goals will be achieved. This includes, where appropriate, breaking out contract work items into economically feasible units to facilitate DBE participation, even when the prime contractor might otherwise prefer to perform these work items with its own forces.
- C. Providing interested DBEs with adequate information about the plans, specifications, and requirements of the contract in a timely manner to assist them in responding to a solicitation.
- D(1) Negotiating in good faith with interested DBEs. It is the ALB's responsibility to make a portion of the work available to DBE subcontractors and suppliers and to select those portions of the work or material needs consistent with the available DBE subcontractors and suppliers, so as to facilitate DBE participation. Evidence of such negotiation includes the names, addresses and telephone numbers of DBEs that were considered; a description of the information provided regarding the plans and specifications for the work selected for subcontracting; and evidence as to why

additional agreements could not be reached for DBEs to perform the work.

- D(2) An ALB using good business judgment would consider a number of factors in negotiating with subcontractors, including DBE subcontractors, and would take a firm's price and capabilities as well as contract goals into consideration. However, the fact that there may be some additional costs involved in finding and using DBEs is not in itself sufficient reason for a bidder's failure to meet the contract DBE goal, as long as such costs are reasonable. Also, the ability or desire of a prime contractor to perform the work of a contract with its own organization does not relieve the ALB of the responsibility to make the good faith efforts. Prime contractors are not, however, required to accept higher quotes from DBEs if the price difference is excessive or unreasonable.
- E. Not rejecting DBEs as being unqualified without sound reasons based on a thorough investigation of their capabilities. The contractor's standing within its industry, membership in specific groups, organizations, or associations and political or social affiliations (for example union vs. non-union employee status) are not legitimate causes for the rejection or non-solicitation of bids in the contractor's efforts to meet the project goal.
- F. Making efforts to assist interested DBEs in obtaining bonding, lines of credit, or insurance as required by the recipient or contractor.
- G. Making efforts to assist interested DBEs in obtaining necessary equipment, supplies, materials, or related assistance or services.
- H. Effectively using the services of available minority/women community organizations; minority/women contractors' groups; local, state, and Federal minority/women business assistance offices; and other organizations as allowed on a case-by-case basis to provide assistance in the recruitment and placement of DBEs.

Following this review, the OCR staff will make a recommendation to the Director of OCR, or designee, (Director) as to whether the ALB has met the DBE goal or made adequate good faith efforts. The Director of OCR will determine whether the ALB has met the DBE goal or made adequate good faith efforts to meet the goal for this contract in accordance with 49 C.F.R. § 26.53 and 49 C.F.R. § 26 Appendix A. The Director's written determination will be mailed to the ALB informing it of this decision approximately 10-12 business days after the Submission Due Date. If the Director determines that the ALB failed to meet the DBE goal or that it failed to make adequate good faith efforts to do so, the determination notice will be sent by certified U.S. mail.

An ALB that fails to meet the DBE goal or fails to make adequate good faith efforts to meet the goal is a non-responsible bidder and shall not be awarded the contract.

ADMINISTRATIVE RECONSIDERATION

If the Director determines that the ALB failed to make adequate good faith efforts, the ALB may request administrative reconsideration. (49 C.F.R. § 26.53(d)). If the ALB does not make a timely written request for administrative reconsideration as described herein, the ALB will be deemed to have waived its right to request administrative reconsideration.

The ALB's request for administrative reconsideration must be made in writing. Requests sent by fax or personal delivery must be received by the Mn/DOT Office of Civil Rights no later than 4:30 PM on the fifth business day after the ALB receives written notice of the determination. Administrative reconsideration requests sent by U.S. mail must be postmarked no later than the fifth business day after the ALB receives notice of the determination. The ALB is deemed to have notice as of the date indicated on the certified mail receipt signed by the ALB, or its representative, at the time of delivery. The ALB must submit the written request for reconsideration to the attention of **Mn/DOT Deputy Commissioner at MnDOT, 395 John Ireland Blvd. St. Paul, Minnesota 55155; or by fax 651-366-4795. A copy of the request must be sent to the Director of the Office of Civil Rights at the same address or fax 651-366-3129.**

The Mn/DOT Deputy Commissioner, or a designated official, will serve as the Reconsideration Official. The Reconsideration Official shall not have any role in the original determination that the ALB failed to meet the DBE goal or failed to make adequate good faith efforts to do so.

In the reconsideration process, the ALB will have the opportunity to:

- Provide written documentation or argument concerning the issue of whether the ALB met the goal or made adequate good faith efforts to do so. (49 C.F.R. § 26.53(d)(1).
- Meet in person with the Reconsideration Official to discuss the issue of whether the ALB met the goal or made adequate good faith efforts to do so. (49 C.F.R. § 26.53(d)(3).

The Reconsideration Official will reconsider the record documenting the good faith efforts of the ALB. The reconsideration process will include the documents and arguments that the ALB is permitted to submit. The reconsideration process is a review of only the good faith efforts made by the ALB as of the Submission Due Date. Good faith efforts made subsequent to that date will not be considered.

Mn/DOT will provide the ALB with a written decision on reconsideration, explaining the basis for the determination **within 5 business days following the date scheduled for the ALB to meet with the Reconsideration Official to discuss the issue.** In accordance with 49 C.F.R. § 26.53(d)(5), the result of Mn/DOT's reconsideration process is not subject to administrative appeal to the U.S. Department of Transportation.

COUNTING DBE PARTICIPATION & COMMERCIALLY USEFUL FUNCTION

In accordance with 49 C.F.R. § 26.55, Mn/DOT will determine the percentage of DBE participation that will be counted toward the overall DBE goal as follows:

- (a) When a DBE participates in a contract, Mn/DOT will only count the value of the work actually performed by the DBE toward DBE goals.
 - 1. The entire amount of the portion of a construction contract (or other contract not covered by paragraph 49 C.F.R. § 26.55(a)(2)) that is performed by the DBE's own forces. Include the cost of supplies and materials obtained by the DBE for the work of the contract, including supplies purchased or equipment leased by the DBE (except supplies, and equipment the DBE subcontractor purchases or leases from the prime contractor or its affiliate).
 - 2. The entire amount of fees or commissions charged by a DBE firm for providing a bona fide service, such as professional, technical, consultant, or managerial services, or for providing bonds or insurance specifically required for the performance of a DOT-assisted contract, counts toward DBE goals, provided that Mn/DOT determines the fee to be reasonable and not excessive as compared with fees customarily allowed for similar services.
 - 3. When a DBE subcontracts part of the work of its contract to another firm, the value of the subcontract work may be counted toward DBE goals only if the DBE's subcontractor is itself a DBE. Work that a DBE subcontracts to a non-DBE firm will not count toward DBE goals.
- (b) When a DBE performs as a participant in a joint venture, Mn/DOT will count a portion of the total dollar value of the contract equal to the distinct, clearly defined portion of the work of the contract that the DBE performs with its own forces toward DBE goals.
- (c) Mn/DOT will count expenditures of a DBE contractor toward DBE goals only if the DBE is performing a commercially useful function on that contract.
 - 1. A DBE performs a commercially useful function when it is responsible for execution of the work of the contract and is carrying out its responsibilities by actually performing, managing, and supervising the work involved. To perform a commercially useful function, the DBE must also be responsible, with respect to materials and supplies used on the Contract, for negotiating price, determining quality and quantity, ordering the materials, and installing (where applicable) and paying for the material itself. To determine whether a DBE is performing a commercially useful function, Mn/DOT will evaluate the amount of work subcontracted, industry practices, whether the amount the firm is to be paid under the Contract is commensurate with the work it is actually performing and DBE credit claimed for its performance of the work, and other relevant factors.

2. A DBE does not perform a commercially useful function if its role is limited to that of an extra participant in a transaction, contract, or project through which the funds are passed in order to obtain the appearance of DBE participation. In determining whether a DBE is such an extra participant, MnDOT must examine similar transactions, particularly those in which DBEs do not participate.
 3. If a DBE does not perform or exercise responsibility for at least 30 percent of the total cost of its contract with its own work force, or the DBE subcontracts a greater portion of the work of a contract than would be expected on the basis of normal industry practice for the type of work involved, Mn/DOT must presume that it is not performing a commercially useful function.
 4. When a DBE is presumed not to be performing a commercially useful function as provided in the preceding paragraph, the DBE may present evidence to rebut this presumption. Mn/DOT may determine that the firm is performing a commercially useful function given the type of work involved and normal industry practices.
 5. Mn/DOT decisions on commercially useful function matters are subject to review by the concerned operating administration, but are not administratively appealable to U.S. DOT.
- (d) Mn/DOT will use the following factors in determining whether a DBE trucking company is performing a commercially useful function:
1. The DBE must be responsible for the management and supervision of the entire trucking operation for which it is responsible on a particular contract, and there can not be a contrived arrangement for the purpose of the meeting DBE goals.
 2. The DBE must itself own and operate at least one fully licensed, insured, and operational truck used on the contract.
 3. The DBE receives credit for the total value of the transportation services it provides on the contract using trucks it owns, insures and operates using drivers it employs.
 4. The DBE may lease trucks from another DBE firm, including an owner-operator who is certified as a DBE. The DBE who leases trucks from another DBE receives credit for the total value of the transportation services the lessee DBE provides on the contract.
 5. The DBE may also lease trucks from a non-DBE firm, including an owner-operator. The DBE who leases trucks from a non-DBE is entitled to credit for the total value of transportation services provided by non-DBE lessees not to exceed the value of transportation services provided by DBE-owned trucks on the contract. Additional participation by non-DBE lessees receives credit only for the fee or commission it receives as a result of the lease arrangement. If a recipient chooses this approach, it must obtain written consent from the Director of the Office of Civil Rights.

6. For purposes of this section, a lease must indicate that the DBE has exclusive use of and control over the truck. This does not preclude the leased truck from working for others during the term of the lease with the consent of the DBE, so long as the lease gives the DBE absolute priority for the use of the leased truck. Leased trucks must display the name and identification number of the DBE.
- (e) Mn/DOT will count expenditures with DBEs for materials or supplies toward DBE goals as provided in the following:
1. Mn/DOT will count 100% of the cost of the materials or supplies toward DBE goals if the materials or supplies are obtained from a DBE manufacturer.
 2. For purposes of this section (e), a manufacturer is a firm that operates or maintains a factory or establishment that produces, on the premises, the materials, supplies, articles, or equipment required under the contract and of the general character described in the specifications.
 3. If the materials or supplies are purchased from a DBE regular dealer, Mn/DOT will count 60% of the cost of the materials or supplies toward DBE goals.
 4. For purposes of this section (e), a regular dealer is a firm that owns, operates, or maintains a store, warehouse, or other establishment in which the materials, supplies, articles or equipment of the general character described by the specifications and required under the contract are bought, kept in stock, and regularly sold to or leased to the public in the usual course of business.
 - A. To be a regular dealer, the firm must be an established, regular business that engages, as its principal business and under its own name, in the purchase and sale or lease of the products in question.
 - B. A person may be a regular dealer in such bulk items as petroleum products, steel, cement, gravel, stone or asphalt without owning, operating, or maintaining a place of business as provided in 49 C.F.R. §26.55(e)(2)(ii) if the person both owns and operates distribution equipment for the products. Any supplementing of regular dealers' own distribution equipment shall be by a long -term lease agreement and not on an ad hoc or contract-by-contract basis.
 - C. Packagers, brokers, manufacturers' representatives, or other persons who arrange or expedite transactions are not regular dealers within the meaning of this section (e).
 5. With respect to materials or supplies purchased from a DBE which is neither a manufacturer nor a regular dealer, Mn/DOT will count the entire amount of fees or commissions charged for assistance in the procurement of the materials and supplies, or fees or transportation charges for the delivery of materials or supplies required on a

job site, toward DBE goals, provided Mn/DOT determines the fees to be reasonable and not excessive as compared with fees customarily allowed for similar services. Mn/DOT, however, will not count any portion of the cost of the materials or supplies themselves toward DBE goals.

- (f) If a firm is not currently certified as a DBE in accordance with the standards of 49 C.F.R. § 26 Subpart D at the time of execution of the contract, Mn/DOT will not count the firm's participation toward any DBE goals.
- (g) The dollar value of the work performed under a contract with a firm after it has ceased to be certified will not be counted toward the overall goal.
- (h) Mn/DOT will not count the participation of a DBE subcontractor toward the contractor's final compliance with its DBE obligations on a contract until the amount being counted has been actually paid to the DBE.

FAILURE TO FULFILL DBE COMMITMENT

Mn/DOT will invoke appropriate administrative sanctions for non-compliance when a contract has been awarded and performance has begun, but the contractor fails to meet the DBE goal or make an adequate good faith effort to do so. Sanctions for noncompliance may include, but are not limited to, Mn/DOT withholding progress payments and taking a monetary deduction from the contract proceeds. If the contractor fails to complete its work on the contracts executed with DBE firms, as required by this contract, and the failure is through no fault of the DBE firms, MnDOT may deduct a sum equal to the portion of the DBE commitment not fulfilled. This provision will not apply if Mn/DOT reduces the quantity of work subcontracted to the DBE.

Mn/DOT may allow an adjustment of the commitment if the DBE participant that was part of the original commitment fails to perform and cannot be replaced with another DBE subcontractor despite the contractor's adequate good faith efforts to find another DBE to perform the same amount of work.

DBE REPLACEMENT

The contractor must make good faith efforts to replace a DBE subcontractor who is unable to perform successfully with another DBE to perform the same amount of work. The contractor shall not terminate for its convenience a DBE subcontract and then perform the work of the terminated subcontract with its own forces.

Once a contractor submits an affidavit, subcontract or other signed agreement, and the DBE Description of Work and Field Monitoring Report (Exhibit A), the DBE firm cannot be replaced by another DBE or a non-DBE firm for any reason until the following occurs:

1. Mn/DOT's Office of Civil Rights receives a written request for approval of the

substitution, including the reasons for the substitution; and,

2. Mn/DOT's Office of Civil Rights grants the contractor a written approval of the substitution.

Mn/DOT staff may assist the Contractor, when requested, in replacing DBEs. This assistance may include but is not limited to:

1. Providing the contractor with information regarding the availability of other DBEs.
2. Providing the contractor with assistance in locating available DBEs

PROMPT PAYMENT

Minnesota Statutes §16A.1245 requires that the prime contractor agrees to pay each subcontractor within ten (10) days of the prime contractor's receipt of payment from the state for undisputed services provided by the subcontractor. The prime contractor is subject to pay interest charges of 1-1/2 percent per month, or any part of a month, to the subcontractor on any undisputed amount not paid to the subcontractor within the ten (10) day period. This provision applies to DBE and non-DBE subcontractors.

Prime contractors are required to make prompt and full payment of any retainage kept by the prime contractor to the subcontractor within 10 days after the subcontractor's work is satisfactorily completed. Satisfactorily completed means when all the tasks called for in the subcontract have been accomplished and documented as required by Mn/DOT. When Mn/DOT has made incremental acceptances of a portion of a prime contract, the work of a subcontractor covered by that acceptance is deemed to be satisfactorily completed. See 49 C.F.R. § 26.29(b) and (c).

Failure to comply with these payment provisions may result in penalties including the withholding of progress payments to prime contractors. Appropriate penalties will be determined by Mn/DOT. The Contractor Payment Form must be completed for payments to subcontractors regardless of their DBE status.



Prime Contractor _____ State Project # _____

**DBE Description of Work
And Field Monitoring Report (Exhibit A)**

A contract will not be awarded to the Prime Contractor unless this form is submitted with a signed subcontract, purchase order or affidavit for each DBE participating in the contract. This form is complete when the DBE subcontractor has filled in **all of the applicable information in sections A and B and signs in section C.**
PLEASE PRINT CLEARLY OR TYPE.

Section (A): (All DBE Subcontractors, including Trucking firms must complete this Section.)

MUST BE COMPLETED BY THE DBE PRINCIPAL

Letting Date: _____ State Project Number: _____
Prime Contractor: _____ Phone #: _____
DBE Subcontractor: _____ Phone #: _____
DBE Principal Name: _____ Total Subcontract \$: _____
DBE Participation Claimed: Percent _____ % Amount \$ _____

1. Did you bid and sign a subcontract agreement with the above-named prime contractor? _____
2. Are the items, quantities, and prices listed on the subcontract agreement or affidavit correct? _____
3. List the line items to be performed: _____

4. Are there any other agreements not addressed in the subcontract? If yes, please explain: _____

5. If equipment to be used is other than what is listed in your DBE certification file please answer the following:
 - a. Will the renting or leasing include any of the following: (Attach a copy of the lease or rental agreement(s).
Equipment _____ Insurance _____ Operator _____ or Maintenance _____
 - b. Lessor's name: _____
Amount to be paid: _____ Number of days to be used: _____
6. Will there be any other firm(s) providing work listed in your (DBE) subcontract?
If yes, answer the following: Firm's Name: _____ \$ amount of the work: _____
2. What is the name of the person supervising your work on this project? _____
Is this your employee? _____
8. How many people will you be employing on this project? _____ Minorities: _____ Females: _____
9. Total dollar amount of materials to be supplied? _____
10. Who are you purchasing the materials from? _____
1. Please submit Purchase Agreement and/or Purchase Order from manufacturer(s) or primary material supplier(s).
NOTE: This Exhibit 'A' will not be approved without the Purchase Agreement/Purchase Order.
2. Please list all subcontracts that your firm will be performing during the current construction season including non-DBE work:
(Attach additional sheet if necessary.)

	Project Number	Prime Contractor	Project Location	# of Working Days
1.				
2.				
3.				

Mn/DOT OCR

8/2010

Prime Contractor _____ State Project # _____

Section (B):

TO BE COMPLETED ONLY BY THE DBE TRUCKER

1. The number of hours contracted or quantities to be hauled on this project? _____
2. How many fully operational units will be used on this Project? _____ (Tractor/trailers: _____ Dump trucks: _____)
3. How many fully operational units will be yours? _____ (Dump trucks: _____ Tractors/trailers: _____)
4. How many other units will be yours? _____ (Tractors: _____ Trailers: _____)
5. If ITO's or trucking companies are to be used on this project answer the following:

	Name of ITO/Company	Dollar Amount of Contract/Agreement	Number of Dump Trucks, Tractors/Trailers (specify)
1.			
2.			
3.			
4.			

Section (C): (All DBE Subcontractors, including Trucking firms, must complete Section C.)

I hereby certify that the information presented above is correct. I agree to inform the Office of Civil Rights in writing of any changes within 10 days of the change(s).

DBE Company: _____

DBE Principal: _____
Signature Title Date

Section (D): TO BE COMPLETED BY Mn/DOT OFFICE OF CIVIL RIGHTS STAFF PERSON

Project Number: _____ District # _____
Mn/DOT OCR Staff Person: _____ Phone No. _____
Project Engineer: _____ On-site Phone #: _____
Office Phone #: _____

Section (E): TO BE COMPLETED BY PROJECT ENGINEER WHEN THE DBE'S PORTION OF WORK IS $\frac{1}{3}$ TO $\frac{1}{2}$ COMPLETED

1. Does it appear that the DBE firm is performing the work specified in (Exhibit "A") description of work?
Yes _____ No _____
2. Does it appear that the DBE contractor is managing their portion of the project and using their own company employees?
Yes _____ No _____
3. Does it appear that the DBE contractor is providing the equipment for their items of work or other work specified?
Yes _____ No _____
4. Does it appear that the quality of the DBE contractor's performance, scheduling and project management are meeting industry standards?
Yes _____ No _____
5. Comments: _____

NOTE: If you, as the Project Engineer, have checked "NO" to any of the above questions or have any other comments, it is important that you contact the Mn/DOT Office of Civil Rights Staff Person assigned to this project.

Project Engineer: _____ Date: _____

Mn/DOT OCR

8/2010



Prime Contractor _____ State Project # _____

Certificate of Good Faith Efforts Consolidated Form (GFE Form) Instructions

This form consolidates the Certificate of Good Faith Efforts, the Good Faith Efforts Affidavit, and the Bidders List in the DBE Special Provisions and is referred to as the GFE Consolidated form. All parts of this form must be completed unless otherwise stated in the section's heading. The Apparent Low Bidder (ALB) must complete this form and submit it with the Good Faith Efforts Information by the Submission Due Date as defined in the DBE Special Provisions. Prime contractors may also use this form to demonstrate good faith efforts when a DBE is replaced after the contract is awarded.

The ALB should include in its Good Faith Efforts Information a cover letter addressed to the Mn/DOT Office of Civil Rights. The cover letter should identify in detail the efforts the ALB made to meet the DBE goal. The ALB is required to thoroughly document its solicitation efforts and justify any bids, quotes or proposals it rejects from properly certified DBE firms. **THE COVER LETTER SHOULD INCLUDE EACH OF THE FACTORS IDENTIFIED IN 49 C.F.R. Part 26, App. A, SUMMARIZED AS FOLLOWS:**

1. This GFE Consolidated Form must be completed. Please note that "**Part D - SOLICITATION OF SUBCONTRACTORS, SUPPLIERS, AND SERVICE PROVIDERS**" on pg. 4, and "**Part G - DBES QUOTED BUT NOT SELECTED**" on pg. 7 are to be completed **ONLY IF** the DBE goal is **NOT** met.
2. A statement of the ALB's overall plan for obtaining DBE participation noting barriers or challenges the ALB encountered in obtaining DBE participation. Specifically, detailing how all necessary and reasonable steps to achieve the DBE goal or other requirements which, by their scope, intensity, and appropriateness to the objective of achieving the DBE goal, could reasonably be expected to obtain sufficient DBE participation - even if the ALB was not successful.
3. **The solicitation requirement is two-fold and includes the *initial solicitation* and *appropriate follow up* with interested DBEs.** Evidence of solicitation efforts of DBEs such as copies of requests for bids sent to DBE firms with identification of the firms clearly stated; fax confirmation sheets displaying the date, fax number, name of DBE firm, and status; list of all DBE firms called, date, contact name and response; or email distribution lists with date and time clearly indicated. The solicitations to DBEs should provide sufficient information about the type of work available on the project.
4. Identify the efforts made to select portions of work to be performed by DBEs in order to increase the likelihood that the DBE goal will be achieved. This includes, where appropriate, breaking out contract work items into economically feasible units to facilitate DBE participation.
5. A detailed explanation of the reason for not accepting DBE quotes. Each non-accepted quote should be addressed individually. Provide an explanation of the efforts the ALB made to negotiate in good faith with interested DBEs. Provide information about any cost comparisons that were considered in the decision to not accept DBE quotes. **The fact that there may be some additional costs involved in finding and using DBEs is not in itself sufficient reason for an ALB's failure to meet the contract DBE goal, as long as such costs are reasonable.** The ALB is not required to accept higher quotes from DBEs if the price difference is excessive or unreasonable. If the ALB makes such a determination it should provide a written explanation for this conclusion.
6. A detailed explanation of the ALBs efforts to assist interested DBEs in obtaining bonding, lines of credit, or insurance.
7. A detailed explanation of the ALBs efforts to assist interested DBEs in obtaining necessary equipment, supplies, materials or related assistance or services.
8. A detailed explanation of the effective use by the ALB of the services of available minority/women community organizations; minority/women contractor's groups; local, state, and Federal minority/women business assistance offices; and other organizations as allowed on a case-by-case basis to provide assistance in the recruitment and placement of DBEs.
9. Provide copies of any advertisements placed on hardcopy or websites. Advertisements should include information about the project(s), type(s) of work for which quotes are being solicited, and specific contact information for the ALB.

Contact the Mn/DOT Office of Civil Rights if you have any questions; main line 651-366-3073



Prime Contractor _____ State Project # _____

Guidelines for Certificate of Good Faith Efforts (GFE) Consolidated Form

The Apparent Low Bidder (ALB) must show that it took all necessary and reasonable steps to achieve the DBE goal which by their scope, intensity and appropriateness to the objective, could reasonably be expected to obtain sufficient DBE participation, even if not fully successful. The criteria for evaluating good faith efforts is described in 49 CFR, Part 26, Appendix A which can be found at <http://www.osdbu.dot.gov/DBEProgram/>. ALBs submitting good faith efforts information should address the following factors in its Good Faith Efforts Information submission. The information below is not a mandatory list, nor is it exclusive or exhaustive.

Criteria 1: "Solicitation Efforts"

1. Did the ALB use the current DBE Directory to identify DBEs?
2. Did the ALB perform sufficient solicitations given the amount of work to meet the DBE goal?
3. Did the ALB break out and solicit for work in economically feasible units?
4. Did the ALB solicit for work that it otherwise would self-perform?
5. Were DBEs with business operations in close geographic proximity to the project solicited?

Criteria 2: "Timely Notice"

1. Did the ALB send timely written (e-mail/fax) solicitation notices to certified DBE firms?
2. Did the solicitation notice include the following:
 - a. Name and location of project
 - b. Bid date
 - c. Scope of work requested
 - d. Location where DBE's can review plans and specifications
 - e. Date and time to submit quote
 - f. Contact name for technical assistance
 - g. Any special requirements

Criteria 3: "Finance and Bonding Outreach"

1. Did the ALB offer assistance by providing contacts for possible bonding, insurance, and lines of credit?
2. Did the ALB offer assistance by providing technical assistance in these areas?

Criteria 4: "ALB follow-Up"

1. Did the contractor maintain a "follow-up log" from the initial solicitation? The log must show:
 - a. Type of contact (fax, telephone, e-mail)
 - b. Name of contact person
 - c. Name of DBE firm
 - d. Date and time of DBE contacted
 - e. Response received
 - f. Reason for DBE not bidding project (if applicable)

Criteria 5: "ALB DBE Program Outreach and Support"

1. Did the ALB host DBE informational workshops, attend Minnesota Department of Transportation (Mn/DOT) sponsored DBE events; such as networking sessions, DBE conferences, DBE/ALB meetings, etc.?
2. Did the ALB contact minority business organizations about DBE opportunities?

Note: The Submission Due Date is **the fifth business day after the bid letting date** in accordance with the Mn/DOT DBE Special Provisions. Contact the Mn/DOT Office of Civil Rights if you have any questions; main line 651-366-3073

Prime Contractor _____ State Project # _____

**MINNESOTA DEPARTMENT OF TRANSPORTATION
OFFICE OF CIVIL RIGHTS
CERTIFICATE OF GOOD FAITH EFFORTS CONSOLIDATED FORM**

This Certificate of Good Faith Efforts Consolidated form (GFE Consolidated form) is required to demonstrate that the Apparent Low Bidder (ALB) either met the DBE goal, or made adequate good faith efforts to meet the DBE goal pursuant to 49 C.F.R. Part 26, Appendix A. Please refer to the instruction sheet prior to completing the form. This form and all supporting Good Faith Efforts documentation must be provided to the Mn/DOT Office of Civil Rights prior to the Submission Due Date as defined within the DBE Special Provisions.

PART A – PRIME CONTRACTOR’S INFORMATION (All Primes complete this section.)				
COMPANY NAME				
ADDRESS	STREET	CITY	STATE	ZIP CODE
PHONE #	FAX #	EMAIL ADDRESS		
CONTACT PERSON		TITLE		

PART B - PROJECT DESCRIPTION (All Primes complete this section.)				
STATE PROJECT #		CONTRACT # (If Applicable)		<input type="checkbox"/> Attach copy of Mn/DOT Advertisement
ANTICIPATED START DATE (Based on progress schedule)			EXPECTED COMPLETION DATE (Based on progress schedule)	
DBE GOAL	%	VS	DBE COMMITMENT	(Type of GFE Information – Check one only) <input type="checkbox"/> Pre-award <input type="checkbox"/> Post-award/Execution
TOTAL DBE PARTICIPATION DOLLARS BASED ON ADVERTISED DBE GOAL (Total prime bid \$ * DBE % Goal)				

PART C – PROJECT SUMMARY AMOUNTS (All Primes complete this section.)	
TOTAL PRIME BID	\$
TOTAL DOLLARS COMMITTED TO NON-DBE’S (Not including suppliers)	\$
TOTAL DOLLARS COMMITTED TO DBE’S (Not including suppliers)	\$
TOTAL DOLLARS COMMITTED TO DBE SUPPLIERS (Total paid to DBE suppliers 60%)	\$
WORKED PERFORMED BY PRIME	\$
PERCENT OF WORK PERFORMED BY PRIME	%
TOTAL DBE PARTICIPATION REMAINING (Difference between DBE goal \$ and DBE commitment \$)	\$

Prime Contractor

State Project #

PART D – SOLICITATION OF SUBCONTRACTORS, SUPPLIERS, AND SERVICE PROVIDERS (Complete this part only if DBE goal is not met.)

List all subcontractors solicited, both DBE and non-DBE contractors, truckers and suppliers for this specific project. Include initial contact and follow-up dates, as well as methods of contact (Phone, Fax, Email, etc.).

The good faith effort submission should include evidence of the solicitation effort such as; copies of request for bids sent to DBE firms with the name of the DBE firms clearly identified; fax confirmation sheets showing the date, fax number, name of DBE firm, confirmation the fax was sent; list of all DBE firms called time of call, person contacted and response; or email lists with time/day sent clearly indicated etc.

Subcontractor/Supplier/Service provider	DBE?		Phone #	Dates, Method of Contact		Description of Work	Dollar Amount of Quote
	Yes	No		DATES	METHO DS		
1	<input type="checkbox"/>	<input type="checkbox"/>					
2	<input type="checkbox"/>	<input type="checkbox"/>					
3	<input type="checkbox"/>	<input type="checkbox"/>					
4	<input type="checkbox"/>	<input type="checkbox"/>					
5	<input type="checkbox"/>	<input type="checkbox"/>					
6	<input type="checkbox"/>	<input type="checkbox"/>					
7	<input type="checkbox"/>	<input type="checkbox"/>					
8	<input type="checkbox"/>	<input type="checkbox"/>					
9	<input type="checkbox"/>	<input type="checkbox"/>					
10	<input type="checkbox"/>	<input type="checkbox"/>					
	<input type="checkbox"/>	<input type="checkbox"/>					
	<input type="checkbox"/>	<input type="checkbox"/>					

Make additional copies of this page as necessary.

Prime Contractor _____

State Project # _____

Make additional copies of this page as necessary.

PART E - DBE COMMITMENTS (All Primes complete this section.)									
DBEs COMMITMENTS									
List only DBEs who have executed Exhibit A forms.									
DBE Contractor Information									
	DBE Contractor Name	Contact Name	Address	Federal Tax #	Phone	E-mail	Fax	Description of Work	Dollar Amount Of Bid/Proposal.
1.									
2.									
3.									
4.									
5.									

Make additional copies of this page as necessary.

PART F – NON-DBE QUOTES SUBMITTED (All Primes complete this section.)							Dollar Amount Of Bid/Proposal.	Will Firm Be Used?
NON-DBE COMMITMENTS List all non-DBE firms who provided quotes or bid proposals. Indicate whether the quotes were accepted.								
NON-DBE Contractor Information								
1.	NON-DBE Contractor Name							Y or N
	Contact Name							
	Address							
	Federal Tax #	E-mail						
	Phone	Fax:						
2.	NON-DBE Contractor Name							Y or N
	Contact Name							
	Address							
	Federal Tax #	E-mail						
	Phone	Fax						
3.	NON-DBE Contractor Name							Y or N
	Contact Name							
	Address							
	Federal Tax #	E-mail						
	Phone	Fax						
4.	NON-DBE Contractor Name							Y or N
	Contact Name							
	Address:							
	Federal Tax #	E-mail						
	Phone	Fax						

Minnesota Department of Transportation
Office of Civil Rights

PART G - DBEs QUOTED BUT NOT SELECTED (Complete this part only if DBE goal is not met.)

If DBE quotes were rejected, attach a separate sheet of paper explaining the specific basis for rejecting any DBE quote.

Note: Additional cost is not in itself sufficient reason for rejecting a DBE quote. However, prime contractors need not accept excessive or unreasonable DBE quotes. The contractor's standing within its industry, membership in specific groups (for example union vs. non-union employee status) are not legitimate causes for the rejection or non-solicitation of bid in the contractor's efforts to meet the project goal. (See Instructions attached to this form.).

QUOTED DOLLARS	DBEs WHO QUOTED, BUT WERE NOT SELECTED	TYPE OF WORK QUOTED	REASON NOT SELECTED
1.			Clearly state specific basis for rejecting the DBE on a separate sheet of paper
2.			Clearly state specific basis for rejecting the DBE on a separate sheet of paper
3.			Clearly state specific basis for rejecting the DBE on a separate sheet of paper
4.			Clearly state specific basis for rejecting the DBE on a separate sheet of paper
5.			Clearly state specific basis for rejecting the DBE on a separate sheet of paper
6.			Clearly state specific basis for rejecting the DBE on a separate sheet of paper
7.			Clearly state specific basis for rejecting the DBE on a separate sheet of paper
8.			Clearly state specific basis for rejecting the DBE on a separate sheet of paper
9.			Clearly state specific basis for rejecting the DBE on a separate sheet of paper
10.			Clearly state specific basis for rejecting the DBE on a separate sheet of paper
11.			Clearly state specific basis for rejecting the DBE on a separate sheet of paper
12.			Clearly state specific basis for rejecting the DBE on a separate sheet of paper
13.			Clearly state specific basis for rejecting the DBE on a separate sheet of paper
14.			Clearly state specific basis for rejecting the DBE on a separate sheet of paper
15.			Clearly state specific basis for rejecting the DBE on a separate sheet of paper
16.			Clearly state specific basis for rejecting the DBE on a separate sheet of paper
17.			Clearly state specific basis for rejecting the DBE on a separate sheet of paper
18.			Clearly state specific basis for rejecting the DBE on a separate sheet of paper
19.			Clearly state specific basis for rejecting the DBE on a separate sheet of paper
20.			Clearly state specific basis for rejecting the DBE on a separate sheet of paper
NUMBER OF DBEs SOLICITED			

PART H – CERTIFICATION / GOOD FAITH EFFORTS AFFIDAVIT (All Primes complete this section.)

STATE OF MINNESOTA
COUNTY OF _____

I, _____, being first duly sworn, state as follows:
(Full Name)

1. I am the _____ of _____
(Title) (Name of Individual, Company, Partnership, or Corporation)

that has been identified as the apparent low bidder of the State Project _____.

2. I have the authority to make this affidavit for and on behalf of the apparent low bidder.
3. The information provided in the attached Certificate of Good Faith Efforts is true and accurate to the best of my belief.

SIGNATURE (Bidder or Authorized Representative)	TITLE	DATE
---	-------	------

Subscribed and sworn to before me

This _____ day of _____, 20____

Notary Public

My commission expires _____, 20____

Under Sec. 26.107 of "49 CFR Part 26," dated February 2, 1999, if at any time, the Department or a recipient has reason to believe that any person or firm has willfully and knowingly provided incorrect information or made false statements, the Department may initiate suspension or debarment proceedings against the person or firm under 49 CFR Part 29, take enforcement action under 49 CFR Part 31, Program Fraud and Civil Remedies, and/or refer the matter to the Department of Justice for criminal prosecution under 18 U.S.C. 1001, which prohibits false statements in Federal programs.



Minnesota Department of Transportation
Office of Civil Rights

Page ____ of ____

Contractor Payment Form

1st Tier Sub-
Contractor:

State Project Number

Prime Contractor:

Payment Reporting Period: From:

To:

Instructions: All Contractors making payments to Contractors/Subcontractors/Suppliers/Service Providers, regardless of their tier or DBE status, are required to complete and submit this form to the Mn/DOT Office of Civil Rights (OCR), each time payments are made to sub-contractors until final payment is made. Failure to comply with this form and Minnesota's prompt payment law may cause progress payments to be withheld. Submit one copy of this form to the Mn/DOT OCR and one copy to the Project Engineer, no later than ten (10) days after receiving payment from Mn/DOT.

Contractor Information		Original Contract Amount	Committed DBE %	Actual DBE % to Date
Name:				
Address:				
Phone:				
Name of Subcontractor/Supplier	DBE? (Check if Yes)	Description of Work		Subcontract Amount
1.	<input type="checkbox"/>	1.		1.
2.	<input type="checkbox"/>	2.		2.
3.	<input type="checkbox"/>	3.		3.
4.	<input type="checkbox"/>	4.		4.
5.	<input type="checkbox"/>	5.		5.
6.	<input type="checkbox"/>	6.		6.
Amount of Current Payment	Total Sub-Contractor Payment-To-Date	% Paid to date	Final Payment? Yes/No	
1.	1.	1.	1.	
2.	2.	2.	2.	
3.	3.	3.	3.	
4.	4.	4.	4.	
5.	5.	5.	5.	
6.	6.	6.	6.	
Company Officials Signature & Title		Name & Title of Individual Completing Report (Type or Print Clearly)		
Title:				
Phone:	Fax:	Phone:	Fax:	

**Minnesota Department of Transportation
Office of Civil Rights**

Contractor Payment Form Instructions

All Contractors making payments to Contractors/Subcontractors/Suppliers/Service Providers, regardless of their tier or DBE status, are required to complete and submit this form to the Mn/DOT Office of Civil Rights (OCR), each time payments are made to sub-contractors until final payment is made. Failure to comply with this form and Minnesota's prompt payment law may cause progress payments to be withheld. Submit one copy of this form to the Mn/DOT OCR and one copy to the Project Engineer, no later than ten (10) days after receiving payment from Mn/DOT.

State Project Number: As identified by Mn/DOT

Prime Contractor: The contractor who was awarded the project.

1st Tier Sub-Contractor: If a subcontractor has a subcontractor, list the 1st tier sub here and then list all of the 2nd tier Subcontractor(s) in the Name of Subcontractor/Supplier area. *All areas should be filled in regarding the prime as well.*

Payment Reporting Period: This should reflect the current payment period.

Contractor Information: Contractor's information who is making the payments. This must be filled out completely.

Original Contract Amount: Prime contractor's contract dollar amount.

Committed DBE%: The DBE commitment certified in the prime's bid is the minimum percentage of DBE participation on the project.

Actual DBE % to Date: The percent met to date.

Name of Subcontractor/Supplier: Company who is working for the prime contractor on this project.
(If a sub was contracted for more than one contract, list each contract separately.)

DBE?: Check this box if the subcontractor is a certified DBE in Minnesota. You can find a listing of the DBE firms certified in Minnesota at <http://www.dot.state.mn.us/eeocm/ucpdirectory.html>.

Description of Work: The type of work the subcontractor was contracted for.

Subcontract Amount: The dollar amount the subcontractor was contracted for.

Amount of Current Payment: The current dollar amount being paid to the sub.

Total Sub-Contractor Payment-to-Date: Total dollar amount paid to the sub including the current payment.

% Paid to Date: Percentage of total payments made in comparison to the prime's award amount.

Final Payment?: Indicate whether this is the final payment being made to the sub.

Company Officials Signature & Title: Self explanatory

Name & Title of Individual Completing Report: Self explanatory

If you have questions on completing the form, call the Office of Civil Rights at (651) 366-3073.

DBE Total Payment Affidavit

Pursuant to Mn/DOT Standard Specifications for Construction, Section 1908, the following DBE Total Payment Affidavit shall be executed by the Prime Contractor after all work contracted to be performed by DBEs has been satisfactorily completed. Identify each DBE firm that worked on the project and the dollar amount of the subcontract. If the dollar value of a DBE firm's total work is less than the DBE's original subcontract, please attach an explanation.

State Project Number: _____

STATE OF MINNESOTA
COUNTY OF _____

I, _____, being first duly sworn, state as follows:
(Full Name)

1. I am the authorized representative of _____ (Name of Individual, Company, Partnership or Corporation) and I have the authority to make this affidavit for and on behalf of said Prime Contractor.

2. The following DBE Subcontractors/Suppliers/Service Providers/Sub-Consultants have performed work on the above project with a total dollar value of:

	Name of DBE Firm	Dollar Amount of Subcontract	Total Dollar Amount
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			

3. I have fully informed myself regarding the accuracy of the statements made in this Affidavit.

Signed: _____
(Prime Contractor or Authorized Representative)

Subscribed and sworn to before me
This _____ day of _____, 20____

(Notary Public)

My commission expires _____, 20____

Prepare Affidavit in duplicate. Submit one original to the Project Engineer, and one original to:
Mn/DOT's Office of Civil Rights
395 John Ireland Blvd., MS 170
St. Paul, MN 55155

No. 1908 – Standard Specifications for Construction

Unless the Contractor has presented an Affidavit showing the total dollar amounts of work performed by Disadvantaged Business Enterprises (DBE), final payment may be withheld.

EQUAL EMPLOYMENT OPPORTUNITY (EEO) SPECIAL PROVISIONS

This section of Special Provisions contains the Equal Employment Opportunity (EEO) rules and regulations for highway construction projects in Minnesota which are federally and/or State funded.

The source of funding determines which EEO regulations and goals (Federal and/or State goals) apply to a specific project. When a project contains funding from both Federal and State sources, both sets of regulations apply, and the Minnesota Department of Transportation (Mn/DOT) monitors and reviews projects at both levels.

If the project contains any Federal funding, and has a total dollar value exceeding \$10,000, Federal EEO regulations and goals apply (pages 2, 6, 7-8, 9-14, 15, 16-17, 22-26, 27-38). The Mn/DOT Office of Civil Rights monitors and reviews these projects on behalf of the Federal Highway Administration (FHWA), under Federal statutes (23 USC 140) and rules (23 CFR 230).

If the project contains any State funding, and has a total dollar value exceeding \$100,000, State EEO regulations and goals apply (pages 2, 3, 4, 5, 6, 9-14, 16-22). Mn/DOT's Office of Civil Rights monitors and reviews these projects in conjunction with the Minnesota Department of Human Rights under Minnesota Statutes §363A.36 and its accompanying rules.

Mn/DOT has established a single review and monitoring process which meets both Federal and State requirements.

Please note that Pages 23-38 of these Special Provisions may be omitted from projects with no Federal funding.

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**NOTICE OF REQUIREMENT FOR AFFIRMATIVE ACTION
TO ENSURE EQUAL EMPLOYMENT OPPORTUNITY
(23 USC 140, 23 CFR 230 and Minnesota Statute 363A.36)**

1. The offerer's or bidder's attention is called to the "Minnesota Affirmative Action Requirements" (EEO Page 4), the "Specific Federal Equal Employment opportunity Responsibilities" (EEO Pages 7-8), the "Standard Federal and State Equal Employment Opportunity Construction Contract Specifications" (EEO Pages 9-14), the "Equal Opportunity Clause" (EEO Page 15) and "Required Contract Provisions - Federal-Aid Construction Contracts" (EEO Pages 27-37).
2. The goals and timetables for minority and women participation, expressed in percentage terms of hours of labor for the Contractor's aggregate work force in each trade on all construction work in the covered area, are as shown on EEO Pages 16-17.

These goals are applicable to all the Contractor's construction work (whether or not it is State or State assisted, Federal or federally assisted) performed in the covered area. If the Contractor performs construction work in a geographical area located outside of the covered area, it shall apply the goals established for such geographical area where the work is actually performed. With regard to this second area, the Contractor also is subject to the goals for both its federally involved and non-federally involved construction.

The Contractor's compliance with the regulations in 41 CFR Part 60-4, and/or Minnesota Statutes §363A.36 and its accompanying rules shall be based on its implementation of the Equal Opportunity Clause, specific affirmative action obligations required by the specifications set forth in 41 CFR 60-4.3(a) for Federal or federally assisted projects, and Minnesota Statutes §363A.36, and its accompanying rules for State or State assisted projects, and its efforts to meet the goals established for the geographical area where the contract resulting from this solicitation is to be performed. The hours of minority and women employment and training must be substantially uniform throughout the length of the contract, and in each trade, and the Contractor shall make a good faith effort to employ minorities and women evenly on each of its projects. The transfer of minority and women employees or trainees from contractor to contractor or from project to project for the sole purpose of meeting the Contractor's goals shall be a violation of the contract, the Executive Order and the regulations in 41 CFR Part 60-4 for Federal or federally-assisted projects and/or Minnesota Statutes §363A.36 and its accompanying rules for state or state-assisted projects. Compliance with the goals will be measured against the total work hours performed.

3. If the contract is federally funded, the Contractor shall provide written notification to the Director of the Office of Federal Contract Compliance Programs (OFCCP) within ten working days of award of any construction subcontract in excess of \$10,000 at any tier for construction work under the contract resulting from this solicitation. If the contract is state funded, the Contractor shall provide written notification to the Compliance Division, Minnesota Department of Human Rights, Army Corps of Engineers Centre, 190 E 5th Street, Suite 700, St. Paul, Minnesota 55101 within ten working days of award of any construction subcontract in excess of \$100,000 at any tier for construction work under the contract resulting from this solicitation. The notification shall list the name, address and telephone number of the Subcontractor; employer identification number of the Subcontractor; estimated dollar amount of the subcontract; estimated starting and completion dates of the subcontract; and the geographical area in which the contract is to be performed.
4. As used in this Notice, and in the contract resulting from this solicitation, the "covered area" is the county or counties of the State of Minnesota where the work is to be performed.

NOTICE TO ALL PRIME AND SUBCONTRACTORS PRE-AWARD REPORTING REQUIREMENTS

In order to ensure compliance with Federal and State laws and regulations (23 USC 140, and 23 CFR 230, and Minnesota Statutes §363A.36) and to ensure Mn/DOT's ability to monitor and enforce compliance efforts, the following requirements apply if the apparent low bid exceeds \$ 5,000,000.00:

- 1) The Apparent Low Bidder ("ALB") must provide to Mn/DOT the "EEO-8 Form" (also entitled "EEO Compliance Review Report"), which must provide detail on the contractor's total company workforce in the State of Minnesota during the twelve month period preceding July 30th of the previous year (Office and/or clerical personnel need not to be included).
- 2) The ALB must provide to Mn/DOT a work plan for meeting the minority and women employment goals established by the Minnesota Department of Human Rights, for the project in question. The work plan must include, at a minimum (1) how the ALB will incorporate its current minority and women employees in the ALB's efforts to meet the established goals; and (2) a contingency plan if the ALB has determined that its current workforce is not sufficient in order to achieve the established employment goals. If the ALB relies in whole or in part upon unions as a source of employees, then the ALB must (1) include a list of established organizations that are likely to yield qualified minority and women candidates if those union(s) are unable to provide a reasonable flow of minority and women candidates in their work plan; and (2) document the method by which these organizations will refer candidates to the ALB for employment opportunities. All bidders are hereby notified that the U.S. Department of Labor has determined that a contractor will not be excused from complying with the Federal and State laws and regulations cited above based solely on the fact that a contractor has a collective bargaining agreement with a union providing for the union to be the exclusive source of referral and that the union failed to refer minority employees. A contractor may obtain a list of organizations likely to yield qualified minority and women candidates from the Mn/DOT Office of Civil Rights.
- 3) The ALB must provide to Mn/DOT the ALB's total workforce and labor projections for the project (represented in hours), the ALB's projected total number of minority hours for the project, and the ALB's projected total number of women hours for the project. The details must include the trade(s) that will be utilized in order to complete the project.

The ALB must submit documents as required to comply with this section no later than five business days after the date that bids for the contract are opened. The five day period starts the business day following the date that bids were opened. The required documents must be received prior to Contract Award, and must be sent to the Mn/DOT Office of Civil Rights – 395 John Ireland Blvd., Mail Stop 170 St. Paul, MN 55155-1899. Submittal of the documents described in (1), (2) and (3) is required for contract award to the ALB. The submitted documents will be used as a tool to assist contractors in meeting employment goals; the content itself will not be evaluated for the purpose of determining contract award.

MINNESOTA AFFIRMATIVE ACTION REQUIREMENTS

1. It is hereby agreed between the parties to this contract that Minnesota Statutes, Section §363A.36, and its accompanying rules are incorporated into any contract between these parties based upon this specification or any modification of it. A copy of Minnesota Statutes, Section §363A.36, and its accompanying rules is available upon request from the contracting agency. The Contractor hereby agrees to comply with the rules and relevant orders of the Minnesota Department of Human Rights issued pursuant to the Minnesota Human Rights Act.
2. It is hereby agreed between the parties to this contract that this agency requires that the Contractor meet affirmative action criteria as provided for by Minnesota Statutes §363A.36 and its accompanying rules. It is the intent of the Minnesota Department of Transportation to fully carry out its responsibility for requiring affirmative action, and to implement sanctions for failure to meet these requirements. Failure by a contractor to implement an affirmative action plan, meet project employment goals for minority and women employment or make a good faith effort to do so may result in revocation of his/her Certificate of Compliance or suspension or revocation of the contract (Minnesota Statutes §363A.36).
3. Under the affirmative action obligation imposed by the Human Rights Act, Minnesota Statutes, Section §363A.36, contractors shall take affirmative action to employ and advance in employment minority, female, and qualified disabled individuals at all levels of employment. Affirmative action must apply to all employment practices, including but not limited to hiring, upgrading, demotion or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation, and selection for training, including apprenticeship. The Contractor shall recruit, hire, train and promote persons in all job titles, without regard to race, color, creed, religion, sex, national origin, marital status, status with regard to public assistance, physical or mental disability, sexual orientation or age except where such status is a bona fide occupational qualification. These affirmative action requirements of the Minnesota Human Rights Act are consistent with but broader than the Federal requirements as covered in this contract.
4. Affirmative Action for disabled workers. The Contractor shall not discriminate against any employee or applicant for employment because of a physical or mental disability in regard to any position for which the employee or applicant for employment is qualified. The Contractor agrees to take affirmative action to employ, advance in employment, and otherwise treat qualified disabled individuals without discrimination based upon their physical or mental disability in all employment practices such as employment, upgrading, demotion or transfer, recruitment, advertising, layoff or termination, rates of pay or other forms of compensation, and selection for training (including apprenticeship). In the event of the Contractor's noncompliance with the requirements of this clause, actions for noncompliance may be taken in accordance with Minnesota Statutes, section §363A.36 and the rules and relevant orders of the Minnesota Department of Human Rights pursuant to the Minnesota Human Rights Act.
5. The Contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices in a form to be prescribed by the commissioner of the Minnesota Department of Human Rights. Such notices shall state the Contractor's obligation under the law to take affirmative action to employ and advance in employment minority, women and qualified disabled employees and applicants for employment, and the rights of applicants and employees. **A poster entitled "Contractor Non-discrimination is the Law" may be obtained from: Compliance Unit, Minnesota Department of Human Rights, Army Corps of Engineers Centre, 190 E. 5th Street, Suite 700, St. Paul, Minnesota 55101. (651) 296-5663, TTY 296-1283, Toll Free 1-800-657-3704.**
6. The Contractor shall notify each labor union or representative of workers with which he/she has a collective bargaining agreement or other contract understanding, that the Contractor is bound by the terms of Minnesota Statutes, section §363A.36 of the Minnesota Human Rights Act, and is committed to take affirmative action to employ and advance in employment minority, women and qualified physically and mentally disabled individuals.

APPROPRIATE WORK PLACE BEHAVIOR ON Mn/DOT CONSTRUCTION PROJECTS UTILIZING STATE FUNDS

It is the Minnesota Department of Transportation's (Mn/DOT's) policy to provide a workplace free from violence, threats of violence, harassment and discrimination. Mn/DOT has established a policy of zero tolerance for violence in the workplace. Contractors who perform work on Mn/DOT construction projects, or local government entities or public agencies utilizing state funds on highway construction projects, shall maintain a workplace free from violence, harassment and discrimination (See definitions, below).

Definitions:

1. Violence is the threatened or actual use of force which results in or has a high likelihood of causing fear, injury, suffering or death. Employees are prohibited from taking reprisal against anyone who reports a violent act or threat.

2. Harassment is the conduct of one employee (toward another employee) which has the purpose or effect of 1) unreasonably interfering with the employee's work performance, and/or 2) creating an intimidating, hostile or offensive work environment. Harassment is not legitimate job-related efforts of supervisor to direct/evaluate an employee or to have an employee improve work performance.

A. Unlawful discriminatory harassment is harassment which is based on these characteristics: race, color, creed, religion, national origin, sex, disability, age, marital status, status with regard to public assistance or sexual orientation. Managers, supervisors and employees shall not take disciplinary or retaliatory action against employees who make complaints of sexual harassment.

Sexual harassment is unwelcome sexual advances, requests for sexual favors, or sexually motivated physical contact, or other verbal or physical conduct or communication of a sexual nature, when submission to that conduct or communication is 1) made a term or condition, either explicitly or implicitly, of obtaining employment; or 2) is used as a factor in decisions affecting an individual's employment; or 3) when that conduct or communication has the purpose or effect of substantially interfering with an individual's employment or creating an intimidating, hostile or offensive work environment, and the employer knows or should have known of the existence of the harassment and fails to take timely and appropriate action. Examples include but are not limited to insulting or degrading sexual remarks or conduct; threats, demands or suggestions that status is contingent upon toleration or acquiescence to sexual advances; displaying in the workplace sexually suggestive objects, publications or pictures, or retaliation against employees for complaining about the behavior cited above or similar behaviors.

B. General harassment is harassment which is not based on the above characteristics. Examples may include, but are not limited to: physically intimidating behavior and/or threats of violence; use of profanity (swearing), vulgarity; ridiculing, taunting, belittling or humiliating another person; inappropriate assignments of work or benefits; derogatory name calling.

3. Discrimination includes actions which cause a person, solely because of race, color, creed, religion, national origin, sex, disability, age, marital status, status with regard to public assistance or sexual orientation to be subject to unequal treatment.

Prime Contractors who work on Mn/DOT projects shall ensure that their managers, supervisors, foremen/women and employees are familiar with Mn/DOT's policy on appropriate work place behavior; and shall ensure that their subcontractors are familiar with this policy. Managers, supervisors and foremen/women will respond to, document, and take appropriate action in response to all reports of violence, threats of violence, harassment or discrimination. Failure to comply with this policy may result in cancellation, termination or suspension of contracts or subcontracts currently held and debarment from further such contracts or subcontracts as provided by statute. If you need additional information or training regarding this policy, please contact the Office of Civil Rights at (651) 366-3073.

NOTICE TO ALL PRIME AND SUBCONTRACTORS REPORTING REQUIREMENTS

1. In order to monitor compliance with Federal Statutes 23 USC 140 and 23 CFR 230, and Minnesota Statutes §363A.36, all prime contractors and subcontractors are required to complete a Mn/DOT Monthly Employment Compliance Report each month for each project (Form EEO-13, sample copy at EEO Pages 20-21.) Prime contractors are also required to complete a Contractor Employment Data Report (Form EEO-12, sample copy at EEO Pages 18-19) once prior to work commencing on the project, unless one has been completed already within the calendar year.

The prime contractor of each project collects Monthly Employment Compliance Reports from each subcontractor who performed work during the month, and completes a Monthly Employment Compliance Report on its own work force. **For the month of July only, an EEO-13 is required for each payroll period within the month of July.** The prime contractor submits the EEO-13 forms to the Mn/DOT Project Engineer by the 15th day of the subsequent month.

Failure to submit the required reports in the allowable time frame will be cause for the imposition of contract sanctions.

It is the intent of Mn/DOT to implement monitoring measures on each project to ensure that each prime contractor and subcontractor is promoting the full realization of equal employment opportunities. Any project may be scheduled for an in depth on-site contract compliance review. During the scheduled on-site review, the Contractor will be required to provide to Mn/DOT documentation of its "good faith efforts" as shown in EEO Pages 10-13, at 7 a-p of this contract.

2. If a Federally funded project requires On-the-Job-Training (OJT) participation, information is provided in the contract and can be located by referring to the Table of Contents for Division S. (OJT is also listed as a bid line item under Trainees.) When a contract requires OJT participation, the Prime Contractor shall submit a training plan as indicated in the Proposal. The training plan shall include the job classification titles of trainees, planned training activities and the approximate start date of trainees.
3. When a Contractor selects a trainee applicant for OJT, the Contractor completes an On the Job Training Program-Trainee Assignment form (sample copy at EEO Page 23) and submits it to the Contract Compliance Specialist (CCS) assigned to the project for approval. The CCS notifies the Contractor and Project Engineer when the applicant is approved.
4. Hours of work performed by OJT employees shall be documented on a monthly basis on the Certification of On-The-Job Training Hours form, (Mn/DOT Form No. 21860, sample copy at EEO Page 24). The Contractor shall submit the original and one copy to the Project Engineer, and one copy to the CCS assigned to the project.

Do not remove forms from this contract. Please duplicate forms from the copies in this contract, or the Mn/DOT Office of Civil Rights will provide these forms upon request. Please call the Office of Civil Rights, (651) 366-3073.

SPECIFIC FEDERAL EQUAL EMPLOYMENT OPPORTUNITY RESPONSIBILITIES (23 CFR 230, Subpart A, Appendix A, FAPG June 6, 1996)

1. General.

a. Equal employment opportunity requirements not to discriminate and to take affirmative action to assure equal opportunity as required by Executive Order 11246 and Executive Order 11375 are set forth in Required contract Provisions (Form PR-1273 or 1316, as appropriate) and these Special Provisions which are imposed pursuant to Section 140 of title 23, U.S.C., as established by Section 22 of the Federal-Aid Highway Act of 1968. The requirements set forth in these Special Provisions shall constitute the specific affirmative action requirements for project activities under this contract and supplement the equal employment opportunity requirements set forth in the Required Contract Provisions.

b. The contractor will work with the State highway agencies and the Federal Government in carrying out equal employment opportunity obligations and in their review of his/her activities under the contract.

c. The contractor and all his/her subcontractors holding subcontracts not including material suppliers, of \$10,000 or more, will comply with the following minimum specific requirement activities of equal employment Opportunity: (The equal employment opportunity requirements of Executive Order 11246, as set forth in volume 6, Chapter 4, Section 1, Subsection 1 of the Federal-Aid Highway program Manual, are applicable to material suppliers as well as contractors and subcontractors.) The contractor will include these requirements in every subcontract of \$10,000 or more with such modification of language as is necessary to make them binding on the subcontractor.

2. Equal Employment Opportunity Policy.

The contractor will accept as his operating policy the following statement which is designed to further the provision of equal employment opportunity to all persons without regard to their race, color, religion, sex, or national origin, and to promote their full realization of equal employment through a positive continuing program:

It is the policy of this Company to assure that applicants are employed, and that employees are treated during employment, without regard to their race, religion, sex, color, or national origin. Such action shall include: employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship, pre apprenticeship, and/or on-the-job training.

3. Equal Employment Opportunity Officer. The contractor will designate and make known to State highway agency

contracting officers an equal employment opportunity officer (hereinafter referred to as the EEO Officer) who will have the responsibility for and must be capable of effectively administering and promoting an active contractor program of equal employment opportunity and who must be assigned adequate authority and responsibility to do so.

4. Dissemination of Policy.

a. All members of the contractor's staff who are authorized to hire, supervise, promote, and discharge employees, or who recommend such action, or who are substantially involved in such action will be made fully cognizant of, and will implement, the contractor's equal employment opportunity policy and contractual responsibilities to provide EEO in each grade and classification of employment. To ensure that the above agreement will be met, the following actions will be taken as a minimum:

(1). Periodic meetings of supervisory and personnel office staff will be conducted before the start of work and then not less often than once every six months, at which time the contractor's equal employment opportunity policy and its implementation will be reviewed and explained. The meetings will be conducted by the EEO Officer or other knowledgeable company official.

(2). All new supervisory or personnel office employees will be given a thorough indoctrination by the EEO Officer or other knowledgeable company official, covering all major aspects of the contractor's equal employment opportunity obligations within thirty days following their reporting for duty with the contractor.

(3). All personnel who are engaged in direct recruitment for the project will be instructed by the EEO officer or appropriate company official in the contractor's procedures for locating and hiring minority group employees.

b. In order to make the contractor's equal employment policy known to all employees, prospective employees and potential sources of employees, i.e., schools, employment agencies, labor unions (where appropriate), college placement officers, etc., the contractor will take the following actions:

(1). Notices and posters setting forth the contractor's equal employment opportunity policy will be placed in areas readily accessible to employees, applicants for employment and potential employees.

(2). The contractor's equal employment opportunity policy and the procedures to implement such policy will be brought to the attention of employees by means of meetings, employee handbooks, or other appropriate means.

5. Recruitment.

a. When advertising for employees, the contractor will include in all advertisements for employees the notation "An Equal Opportunity Employer." All such advertisements will be published in newspapers or other publications having a large circulation among minority groups in the area from which the project work force would normally be derived.

b. The contractor will, unless precluded by a valid bargaining agreement, conduct systematic and direct recruitment through public and private employee referral sources likely to yield qualified minority group applicants, including, but not limited to, State employment agencies, schools, colleges and minority group organizations. To meet this requirement, the contractor will, through his/her EEO Officer, identify sources of potential minority group employees, and establish with such identified sources procedures whereby minority group applicants may be referred to the contractor for employment consideration.

In the event the contractor has a valid bargaining agreement providing for exclusive hiring hall referrals, he is expected to observe the provisions of that agreement to the extent that the system permits the contractor's compliance with equal employment opportunity contract provisions. (The U.S. Department of Labor has held that where the implementation of such agreements have the effect of discriminating against minorities or women, or obligates the contractor to do the same, such implementation violates Executive Order 11246, as amended.)

c. The contractor will encourage his present employees to refer minority group applicants for employment by posting appropriate notices or bulletins in areas accessible to all such employees. In addition, information and procedures with regard to referring minority group applicants will be discussed with employees.

6. Personnel Actions. Wages, working conditions, and employee benefits shall be established and administered, and personnel actions of every type, including hiring, upgrading, promotion, transfer, demotion, layoff, and termination, shall be taken without regard to race, color, religion, sex, or national origin. The following procedures shall be followed:

a. The contractor will conduct periodic inspections of project sites to insure that working conditions and employee facilities do not indicate discriminatory treatment of project site personnel.

SPECIFIC FEDERAL EQUAL EMPLOYMENT OPPORTUNITY RESPONSIBILITIES (con=t)

b. The contractor will periodically evaluate the spread of wages paid within each classification to determine any evidence of discriminatory wage practices.

c. The contractor will periodically review selected personnel actions in depth to determine whether there is evidence of discrimination. Where evidence is found, the contractor will promptly take corrective action. If the review indicates that the discrimination may extend beyond the actions reviewed, such corrective action shall include all affected persons.

d. The contractor will promptly investigate all complaints of alleged discrimination made to the contractor in connection with his/her obligations under this contract, will attempt to resolve such complaints, and will take appropriate corrective action within a reasonable time. If the investigation indicates that the discrimination may affect persons other than the complainant, such corrective action shall include such other persons. Upon completion of each investigation, the contractor will inform every complainant of all his avenues of appeal.

7. Training and Promotion.

a. The contractor will assist in locating, qualifying, and increasing the skills of minority group and women employees and applicants for employment.

b. Consistent with the contractor's work force requirements and as permissible under Federal and State regulations, the contractor shall make full use of training programs, i.e. apprenticeship, and on-the-job training programs for the geographical area of contract performance. Where feasible, 25 percent of apprentices or trainees in each occupation shall be in their first year of apprenticeship or training. In the event the Training Special Provision is provided under this contract, this subparagraph will be superseded as indicated in Attachment 2.

c. The contractor will advise employees and applicants for employment of available training programs and entrance requirements for each.

d. The Contractor will periodically review the training and promotion potential of minority group and women employees and will encourage eligible employees to apply for such training and promotion.

8. **Unions.** If a contractor relies in whole or in part upon unions as a source of employees, the contractor will use his/her best efforts to obtain the cooperation of such unions to increase opportunities for minority groups and women within the

unions, and to effect referrals by such unions of minority and female employees. Actions by the contractor either directly or through a contractor's association acting as agent will include the procedures set forth below:

a. The contractor will use best efforts to develop, in cooperation with the unions, joint training programs aimed toward qualifying more minority group members and women for membership in the unions and increasing the skills of minority group members and women so that they may qualify for higher paying employment.

b. The contractor will use best efforts to incorporate an equal employment opportunity clause into each union agreement to the end that such union will be contractually bound to refer applicants without regard to their race, color, religion, sex, or national origin.

c. The contractor is to obtain information as to the referral practices and policies of the labor union except that to the extent such information is within the exclusive possession of the labor union and such labor union refuses to furnish such information to the contractor, the contractor shall so certify to the State highway department and shall set forth what efforts have been made to obtain such information.

d. In the event the union is unable to provide the contractor with a reasonable flow of minority and women referrals within the time limit set forth in the collective bargaining agreement, the contractor will, through independent recruitment efforts, fill the employment vacancies without regard to race, color, religion, sex, or national origin; making full efforts to obtain qualified and/or qualifiable minority group persons and women. (The U.S. Department of Labor has held that it shall be no excuse that the union with which the contractor has a collective bargaining agreement providing for exclusive referral failed to refer minority employees.) In the event the union referral practice prevents the contractor from meeting the obligations pursuant to Executive Order 11246, as amended, and these special provisions, such contractor shall immediately notify the State highway agency.

9. Subcontracting.

a. The contractor will use his best efforts to solicit bids from and to utilize minority group subcontractors or subcontractors with meaningful minority group and female representation among their employees. Contractors shall obtain lists of minority-owned construction firms from

State highway agency personnel.

b. The contractor will use his best efforts to ensure subcontractor compliance with their equal employment opportunity obligations.

10. Records and Reports:

a. The contractor shall keep such records as necessary to determine compliance with the contractor's equal employment opportunity obligations. The records kept by the contractor will be designed to indicate:

(1) The number of minority and non minority group members and women employed in each work classification on the project.

(2) The progress and efforts being made in cooperation with unions to increase employment opportunities for minorities and women (applicable only to contractor's who rely in whole or in part on unions as a source of their work force).

(3) The progress and efforts being made in locating, hiring, training, qualifying, and upgrading minority and female employees, and

(4) The progress and efforts being made in securing the services of minority group subcontractors with meaningful minority and female representation among their employees.

b. All such records must be retained for a period of three years following completion of the contract work and shall be available at reasonable times and places for inspection by authorized representatives of the State highway agency and the Federal Highway Administration.

c. The contractors will submit an annual report to the State highway agency each July for the duration of the project, indicating the number of minority, women, and non-minority group employees currently engaged in each work classification required by the contract work. This information is to be reported on Form PR-1391. If on-the-job training is being required by a "Training Special Provision", the contractor will be required to furnish Form FHWA 1409.

**STANDARD FEDERAL AND STATE EQUAL EMPLOYMENT OPPORTUNITY
CONSTRUCTION CONTRACT SPECIFICATIONS
(41 CFR 60-4.3 and Minnesota Statutes 363A.36)**

Unless noted, the following apply to both Federal/federally assisted projects and State/state assisted projects. Item 3 applies to Federal/federally assisted projects only

1. As used in these specifications:
 - a. "Covered area" means the geographical area described in the solicitation from which this contract resulted;
 - b. "Director" means Director, Office of Federal Contract Compliance Programs, United States Department of Labor, or any person to whom the Director delegates authority;
 - c. "Employer Identification number" means the Federal Social Security number used on the Employer's Quarterly Federal Tax Return, U.S. Treasury Department Form 941.
 - d. "Minority" includes:
 - (i) Black (all persons having origins in any of the Black African racial groups not of Hispanic origin);
 - (ii) Hispanic (all persons of Mexican, Puerto Rican, Cuban, Central or South American or other Spanish Culture or origin, regardless of race);
 - (iii) Asian and Pacific Islander (all persons having origins in any of the original peoples of the Far East, Southeast Asia, the Indian Subcontinent, or the Pacific Islands); and
 - (iv) American Indian or Alaskan Native (all persons having origins in any of the original peoples of North America and maintaining identifiable tribal affiliations through membership and participation or community identification).
2. Whenever the Contractor, or any Subcontractor at any tier, subcontracts a portion of the work involving any construction trade, it shall physically include in each subcontract in excess of \$10,000 (\$100,000 for State projects) the provisions of these specifications and the Notice which contains the applicable goals for minority and women participation and which is set forth in the solicitations from which this contract resulted.
3. If the Contractor is participating (pursuant to 41 CFR 60-4, 5) in a Hometown Plan approved by the U.S. Department of Labor in the covered area either individually or through an association, its affirmative action obligations on all work on the Plan area (including goals and timetables) shall be in accordance with that Plan for those trades which have unions participating in the Plan. Contractors must be able to demonstrate their participation in and compliance with the provisions of any such Hometown Plan. Each Contractor or Subcontractor participating in an approved Plan is individually required to comply with its obligations under the EEO clause, and to make a good faith effort to achieve each goal under the Plan in each trade in which it has employees. The overall good faith performance by other Contractors or Subcontractors toward a goal in an approved Plan does not excuse any covered contractor's or subcontractor's failure to take good faith efforts to achieve the Plan goals and timetables.
4. The Contractor shall implement the specific affirmative action standards provided in paragraphs 7(a) to (p) of these specifications (itemized as 4 [a] to [o], Minnesota Rules

**STANDARD FEDERAL AND STATE EEO CONSTRUCTION
CONTRACT SPECIFICATIONS (con't)**

5000.3535). The goals set forth in the solicitation from which this contract resulted are expressed as percentages of the total hours of employment and training of minorities and utilization the Contractor should (shall, for State or state assisted projects) reasonably be able to achieve in each construction trade in which it has employees in the covered area. The Contractor shall make substantially uniform progress toward its goals in each craft during the period specified. Covered construction contractors performing construction work in geographical areas where they do not have a Federal or federally assisted construction contract shall apply the minority and female goals established for the geographical area where the work is being performed. Federal goals are published periodically in the Federal Register in notice form, and such notices may be obtained from any office of Federal Contract Compliance programs or from Federal procurement contracting officers. State goals are published periodically in the State Register in notice form, and may be obtained from the Minnesota Department of Human Rights or the Minnesota Department of Transportation Office of Civil Rights. The Contractor is expected to make substantially uniform progress toward its goals in each craft during the period specified.

5. Neither the provisions of any collective bargaining agreement nor the failure by a union, with whom the Contractor has a collective bargaining agreement, to refer either minorities or women shall excuse the Contractor's obligations under these specifications and Executive Order 11246 and its associated rules and regulations for Federal or federally assisted projects, and Minnesota Statutes, Section §363A.36 of the Minnesota Human Rights Act, or the rules adopted under the Act for State or state assisted projects.
6. In order for the nonworking training hours of apprentices and trainees to be counted in meeting the goals, such apprentices and trainees shall be employed by the Contractor during the training period, and the Contractor must have made a commitment to employ the apprentices and trainees at the completion of their training, subject to the availability of employment opportunities. Trainees shall be trained according to training programs approved by the Minnesota Department of Human Rights, the Minnesota Department of Labor and Industry, or the United States Department of Labor.
7. The Contractor shall take specific affirmative actions to ensure equal employment opportunity. The evaluation of the Contractor's compliance with these specifications must be based upon its effort to achieve maximum results from its actions. The Contractor shall document these efforts fully, and shall implement affirmative action steps at least as extensive as the following (referred to in Minnesota Rules 5000.3535 as items 4(a) to (o):
 - (a) Ensure and maintain, or for State or state assisted projects make a good faith effort to maintain, a working environment free of harassment, intimidation, and coercion at all sites and in all facilities at which the Contractor's employees are assigned to work. For

**STANDARD FEDERAL AND STATE EEO CONSTRUCTION
CONTRACT SPECIFICATIONS (con't)**

Federal or federally assisted projects, the Contractor, where possible, will assign two or more women to each construction project. The Contractor shall specifically ensure that all foremen, superintendents, and other on-site supervisory personnel are aware of and carry out the Contractor's obligation to maintain such a working environment, with specific attention to minority or women individuals working at such sites or in such facilities.

- (b) Establish and maintain a current list of minority and women recruitment sources, provide written notification to minority and women recruitment sources and to community organizations when the Contractor or its unions have employment opportunities available, and maintain a record of the organizations' responses.
- (c) Maintain a current file of the names, addresses, and telephone numbers of each minority and woman off-the-street applicant and minority or woman referral from a union, a recruitment source, or community organization and of what action was taken with respect to each individual. If the individual was sent to the union hiring hall for referral and was not referred back to the Contractor by the union or, if referred, not employed by the Contractor, this shall be documented in the file with the reason therefore along with whatever additional actions the Contractor may have taken.
- (d) Provide immediate written notification to the commissioner of the Minnesota Department of Human Rights for State or state assisted projects, or the director of the Office of Federal Contract Compliance for Federal or federally assisted projects, when the union, or unions with which the Contractor has a collective bargaining agreement, has not referred to the Contractor a minority person or woman sent by the Contractor, or when the Contractor has other information that the union referral process has impeded the Contractor's efforts to meet its obligations.
- (e) Develop on-the-job training opportunities and/or participate in training programs for the areas which expressly include minorities and women, including upgrading programs and apprenticeship and trainee programs relevant to the Contractor's employment needs, especially those programs funded or approved by the State of Minnesota for State or state assisted projects or the Department of Labor, for Federal or federally assisted projects. The Contractor shall provide notice of these programs to the sources compiled under (b).
- (f) Disseminate the Contractor's equal employment opportunity policy by providing notice of the policy to unions and training programs and requesting their cooperation in assisting the Contractor in meeting its equal employment opportunity obligations; by including it in any policy manual and collective bargaining agreement; by publicizing it in the company newspaper, annual report, etc.; by specific review of the policy with all management personnel and with all minority and women employees at least once a year; and by posting the company equal employment opportunity policy on bulletin boards accessible to all employees at each location where construction work is performed.

**STANDARD FEDERAL AND STATE EEO CONSTRUCTION
CONTRACT SPECIFICATIONS (con't)**

- (g) Review, at least annually, the company's equal employment opportunity policy and affirmative action obligations under these specifications with all employees having any responsibility for hiring, assignment, layoff, termination, or other employment decisions; including specific review of these items with onsite supervisory personnel such as superintendents, general foremen, etc., prior to the first day of construction work at any job site. A written record shall be made and maintained identifying the time and place of these meetings, persons attending, subject matter discussed, and disposition of the subject matter.
- (h) Disseminate the Contractor's equal employment opportunity policy externally by including it in any advertising in the news media, specifically including minority and women news media, and providing written notification to and discussing the Contractor's equal employment opportunity policy with other contractors and subcontractors with whom the Contractor does or anticipates doing business.
- (i) Direct its recruitment efforts, both oral and written, to minority, women, and community organizations; to schools with minority and women students; and to minority and women recruitment and training organizations serving the Contractor's recruitment area and employment needs. Not later than one month prior to the date for the acceptance of applications for apprenticeship or other training by any recruitment source, the Contractor shall send written notification to organizations, such as the above, describing the openings, screening procedures, and tests to be used in the selection process.
- (j) Encourage present minority and women employees to recruit other minority persons and women and, where reasonable, provide after school, summer and vacation employment to minority and women youth, both on the site and in other areas of a Contractor's work force.
- (k) Validate all tests and other selection requirements where there is an obligation to do so under 41 CFR Part 60-3. (This requirement applies only to Federal and federally assisted projects.)
- (l) Conduct, at least annually, an inventory and evaluation at least of all minority and women personnel for promotional opportunities; and encourage these employees to seek or to prepare for, through appropriate training, such opportunities. (This is Item 4(k) in Minnesota Rules.)
- (m) Ensure that seniority practices, job classifications, work assignments, and other personnel practices do not have a discriminatory effect by continually monitoring all personnel and employment-related activities to ensure that the equal employment opportunity policy and the Contractor's obligations under these specifications are being carried out. (This is item 4(l) in Minnesota Rules.)

**STANDARD FEDERAL AND STATE EEO CONSTRUCTION
CONTRACT SPECIFICATIONS (con't)**

- (n) Ensure that all facilities and company activities are non-segregated except that separate or single-user toilet and necessary changing facilities shall be provided to assure privacy between the sexes. (This is item 4(m) in Minnesota Rules.)
 - (o) Document and maintain a record of all solicitations or offers for subcontracts from minority and women construction contractors and suppliers, including circulation of solicitations to minority and women contractor associations and other business associations. (This is item 4(n) in Minnesota Rules.)
 - (p) Conduct a review, at least annually, of all supervisors' adherence to and performance under the Contractor's equal employment opportunity policies and affirmative action obligations. (This is item 4(o) in Minnesota Rules.)
8. Contractors are encouraged to participate in voluntary associations which assist in fulfilling one or more of their affirmative action obligations (7(a) to (p) for Federal or federally assisted projects, and 4(a)-(o) for State or state assisted projects). The efforts of a contractor association, joint contractor-union, contractor-community, or other similar group of which the Contractor is a member and participant, may be asserted as fulfilling any one or more of its obligations under 7(a) to (p) or 4(a) to (o) of these specifications provided that the Contractor actively participates in the group, makes every effort to assure that the group has a positive impact on the employment of minorities and women in the industry, ensures that the concrete benefits of the program are reflected in the Contractor's minority and women work force participation, makes a good faith effort to meet its individual goals and timetables, and can provide access to documentation which demonstrates the effectiveness of actions taken on behalf of the Contractor. The obligation to comply, however, is the Contractor's and failure of such a group to fulfill an obligation shall not be defense for the Contractor's noncompliance.
9. A single goal for minorities and a separate single goal for women have been established. The Contractor however, is required to provide equal employment opportunity and to take affirmative action for all minority groups both male and female, and all women both minority and non-minority. Consequently, the Contractor may be in violation of the Executive Order for Federal or federally assisted projects, or Minnesota Rules for State or state assisted projects, if a particular group is employed in a substantially disparate manner (for example, even though the Contractor has achieved its goals for women generally, the Contractor may be in violation of the Executive Order or Minnesota Rules part 5000.3520 if a specific minority group is under-utilized).
10. The Contractor shall not use the goals and timetables or affirmative action standards to discriminate against any person because of race, color, creed, religion, sex, or national origin. Minnesota Statutes §363A.36, part 5000.3535 (Subp. 7) also prohibits discrimination with regard to marital status, status with regard to public assistance, disability, age, or sexual orientation.

**STANDARD FEDERAL AND STATE EEO CONSTRUCTION
CONTRACT SPECIFICATIONS (con't)**

11. The Contractor shall not enter into any subcontract with any person or firm debarred from government contracts under the federal Executive Order 11246 or a local human rights ordinance, or whose certificate of compliance has been suspended or revoked pursuant to Minnesota Statutes, Section §363A.36.
12. The Contractor shall carry out such sanctions for violation of these specifications and of the equal opportunity clause, including suspension, termination, and cancellation of existing contracts as may be imposed or ordered pursuant to Minnesota Statutes, Section §363A.36, and its implementing rules for State or state assisted projects, or Executive Order 11246, as amended, and its implementing regulations, by the Office of Federal Contract Compliance Programs for Federal or federally assisted projects. Any contractor who fails to carry out such sanctions shall be in violation of these specifications and Minnesota Statutes, Section §363A.36, or Executive Order 11246 as amended.
13. The Contractor, in fulfilling its obligations under these specifications, shall implement specific affirmative action steps, at least as extensive as those standards prescribed in paragraph 7 of these specifications (paragraph 4 in Minnesota Rules 5000.3535), so as to achieve maximum results from its efforts to ensure equal employment opportunity. If the Contractor fails to comply with the requirements of these Specifications or Minnesota Statutes, Section §363A.36 and its implementing rules, or Executive Order 11246 and its regulations, the commissioner or the director shall proceed in accordance with Minnesota Rules part 5000.3570 for State or state assisted projects, or 41 CFR 60-4.8 for Federal or federally assisted projects.
14. The Contractor shall designate a responsible official to monitor all employment-related activity to ensure that the company equal employment opportunity policy is being carried out, to submit reports relating to the provisions hereof as may be required by the Minnesota Department of Human Rights or the Government, and to keep records. Records shall at least include for each employee the name, address, telephone numbers, construction trade, union affiliation if any, employee identification number when assigned, social security number, race, sex, status (for example, mechanic, apprentice trainee, helper, or laborer), dates of changes in status, hours worked per week in the indicated trade, rate of pay, and locations at which the work was performed. Records shall be maintained in an easily understandable and retrievable form; however, to the degree that existing records satisfy this requirement, contractors shall not be required to maintain separate records.
15. Nothing provided in this part shall be construed as a limitation upon the application of other state or federal laws which establish different standards of compliance or upon the application of requirements for the hiring of local or other area residents.

EQUAL OPPORTUNITY CLAUSE
(41 CFR Part 60-1.4 b, 7-1-96 Edition)

The applicant hereby agrees that it will incorporate or cause to be incorporated into any contract for construction work, or modification thereof, as defined in the regulations of the Secretary of Labor at 41 CFR Chapter 60, which is paid for in whole or in part with funds obtained from the Federal Government or borrowed on the credit of the Federal Government pursuant to a grant, contract, loan, insurance, or guarantee, the following equal opportunity clause:

During the performance of this contract, the Contractor agrees as follows:

1. The Contractor will not discriminate against any employee or applicant for employment because of race, color, religion, sex, or national origin. The Contractor will take affirmative action to ensure that applicants are employed and that employees are treated during employment without regard to their race, color, religion, sex, or national origin. Such action shall include, but not be limited to, the following: employment, upgrading, demotion or transfer; recruitment or recruitment advertising; layoffs or termination; rates of pay or other forms of compensation; and, selection for training, including apprenticeship. The Contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided by the State Highway Agency (SHA) setting forth the provisions of this nondiscrimination clause.
2. The Contractor will, in all solicitations or advertisements for employees placed by or on behalf of the contractor, state that all qualified applicants will receive consideration for employment without regard to race, color, religion, sex, or national origin.
3. The Contractor will send to each labor union or representative of workers with which the Contractor has a collective bargaining agreement or other contract or understanding, a notice to be provided advising the said labor union or workers' representative of the Contractor's commitments under this section, and shall post copies of the notice in conspicuous places available to employees and applicants for employment.
4. The Contractor will comply with all provisions of Executive Order 11246, Equal Employment Opportunity, dated September 24, 1965, and of the rules, regulations (41 CFR Part 60), and relevant orders of the Secretary of Labor.
5. The Contractor will furnish all information and reports required by Executive Order 11246 and by rules, regulations, and orders of the Secretary of Labor, pursuant thereto, and will permit access to its books, records, and accounts by the Federal Highway Administration (FHWA) and the Secretary of Labor for purposes of investigation to ascertain compliance with such rules, regulations, and orders.
6. In the event of the Contractor's noncompliance with the nondiscrimination clauses of this contract, or with any of such rules, regulations, or orders, this contract may be canceled, terminated, or suspended in whole or in part, and the Contractor may be declared ineligible for further Government contracts or federally-assisted construction contracts in accordance with procedures authorized in Executive Order 11246 of September 24, 1965, and such other sanctions as may be imposed and remedies invoked as provided in Executive Order 11246 or by rule, regulation, or order of the Secretary of Labor, or as otherwise provided by law.
7. The Contractor will include the portion of the sentence immediately preceding paragraph (1) and the provisions of paragraph (1) through (7) in every subcontract or purchase order so that such provisions will be binding upon each subcontractor or vendor, unless exempted by rules, regulations, or orders of the Secretary of Labor issued pursuant to Section 204 of Executive Order 11246. The Contractor will take such action with respect to any subcontract or purchase order as the Secretary of Labor, SHA, or the Federal Highway Administration (FHWA) may direct as a means of enforcing such provisions, including sanctions for noncompliance. In the event a contractor becomes a party to litigation by a subcontractor or vendor as a result of such direction, the contractor may request the SHA to enter into such litigation to protect the interest of the State. In addition, the Contractor may request the United States to enter into such litigation to protect the interests of the United States.

The applicant further agrees that it will be bound by the above equal opportunity clause with respect to its own employment practices when it participates in federally assisted construction work: *Provided*, that if the applicant so participating is a State or local government, the above equal opportunity clause is not applicable to any agency, instrumentality or subdivision of such government which does not participate in work on or under the contract.

The applicant agrees that it will assist and cooperate actively with the administering agency and the Secretary of Labor in obtaining the compliance of contractors and subcontractors with the equal opportunity clause and the rules, regulations, and relevant orders of the Secretary of Labor, that it will furnish the administering agency and the Secretary of Labor such information as they may require for the supervision of such compliance, and that it will otherwise assist the administering agency in the discharge of the agency's primary responsibility for securing compliance.

The applicant further agrees that it will refrain from entering into any contract or contract modification subject to Executive Order 11246 of September 24, 1965, with a contractor debarred from, or who has not demonstrated eligibility for, Government contracts and federally assisted construction contracts pursuant to the Executive order and will carry out such sanctions and penalties for violation of the equal opportunity clause as may be imposed upon contractors and subcontractors by the administering agency or the Secretary of Labor pursuant to Part II, Subpart D of the Executive order. In addition, the applicant agrees that if it fails or refuses to comply with these undertakings, the administering agency may take any or all of the following actions: Cancel, terminate, or suspend in whole or in part this grant (contract, loan, insurance, guarantee); refrain from extending any further assistance to the applicant under the program with respect to which the failure or refund occurred until satisfactory assurance of future compliance has been received from such applicant; and refer the case to the Department of Justice for appropriate legal proceedings.

Minority and Women Employment Goals

County	Federal Goals		State Goals	
	Minority Goal	Women Goal	Minority Goal	Women Goal
Aitkin	2.2%	6.9%	5%	6%
Anoka	2.9%	6.9%	11%	6%
Becker	0.7%	6.9%	6%	6%
Beltrami	2.0%	6.9%	6%	6%
Benton	0.5%	6.9%	3%	6%
Big Stone	2.2%	6.9%	4%	6%
Blue Earth	2.2%	6.9%	4%	6%
Brown	2.2%	6.9%	4%	6%
Carlton	1.2%	6.9%	5%	6%
Carver	2.9%	6.9%	11%	6%
Cass	2.2%	6.9%	6%	6%
Chippewa	2.2%	6.9%	4%	6%
Chisago	2.9%	6.9%	3%	6%
Clay	0.7%	6.9%	6%	6%
Clearwater	2.0%	6.9%	6%	6%
Cook	1.2%	6.9%	5%	6%
Cottonwood	0.8%	6.9%	4%	6%
Crow Wing	2.2%	6.9%	6%	6%
Dakota	2.9%	6.9%	11%	6%
Dodge	0.9%	6.9%	4%	6%
Douglas	2.2%	6.9%	6%	6%
Faribault	2.2%	6.9%	4%	6%
Fillmore	0.9%	6.9%	4%	6%
Freeborn	0.9%	6.9%	4%	6%
Goodhue	2.2%	6.9%	4%	6%
Grant	2.2%	6.9%	6%	6%
Hennepin	2.9%	6.9%	11%	6%
Houston	0.6%	6.9%	4%	6%
Hubbard	2.0%	6.9%	6%	6%
Isanti	2.2%	6.9%	3%	6%
Itasca	1.2%	6.9%	5%	6%
Jackson	0.8%	6.9%	4%	6%
Kanabec	2.2%	6.9%	3%	6%
Kandiyohi	2.2%	6.9%	3%	6%
Kittson	2.0%	6.9%	6%	6%
Koochiching	1.2%	6.9%	5%	6%
Lac Qui Parle	2.2%	6.9%	4%	6%
Lake	1.2%	6.9%	5%	6%
Lake of the Woods	2.0%	6.9%	6%	6%
Le Sueur	2.2%	6.9%	4%	6%
Lincoln	0.8%	6.9%	4%	6%
Lyon	0.8%	6.9%	4%	6%

Minnesota Department of Transportation
Office of Civil Rights

Special Provisions
Revised 05/10

County	Federal Goals		State Goals	
	Minority Goal	Women Goal	Minority Goal	Women Goal
Mahnomen	2.0%	6.9%	6%	6%
Marshall	2.0%	6.9%	6%	6%
Martin	2.2%	6.9%	4%	6%
McLeod	2.2%	6.9%	3%	6%
Meeker	2.2%	6.9%	3%	6%
Mille Lacs	2.2%	6.9%	3%	6%
Morrison	2.2%	6.9%	6%	6%
Mower	0.9%	6.9%	4%	6%
Murray	0.8%	6.9%	4%	6%
Nicollet	2.2%	6.9%	4%	6%
Nobles	0.8%	6.9%	4%	6%
Norman	2.0%	6.9%	6%	6%
Olmsted	1.4%	6.9%	4%	6%
Otter Tail	2.2%	6.9%	6%	6%
Pennington	2.0%	6.9%	6%	6%
Pine	2.2%	6.9%	3%	6%
Pipestone	0.8%	6.9%	4%	6%
Polk	1.2%	6.9%	6%	6%
Pope	2.2%	6.9%	6%	6%
Ramsey	2.9%	6.9%	11%	6%
Red Lake	2.0%	6.9%	6%	6%
Redwood	0.8%	6.9%	4%	6%
Renville	2.2%	6.9%	3%	6%
Rice	2.2%	6.9%	4%	6%
Rock	0.8%	6.9%	4%	6%
Roseau	2.0%	6.9%	6%	6%
Scott	2.9%	6.9%	11%	6%
Sherburne	0.5%	6.9%	3%	6%
Sibley	2.2%	6.9%	4%	6%
St. Louis	1.0%	6.9%	5%	6%
Stearns	0.5%	6.9%	3%	6%
Steele	0.9%	6.9%	4%	6%
Stevens	2.2%	6.9%	6%	6%
Swift	2.2%	6.9%	4%	6%
Todd	2.2%	6.9%	6%	6%
Traverse	2.2%	6.9%	6%	6%
Wabasha	0.9%	6.9%	4%	6%
Wadena	2.2%	6.9%	6%	6%
Waseca	2.2%	6.9%	4%	6%
Washington	2.9%	6.9%	11%	6%
Watonwan	2.2%	6.9%	4%	6%
Wilkin	0.7%	6.9%	6%	6%
Winona	0.6%	6.9%	4%	6%
Wright	2.9%	6.9%	3%	6%
Yellow Medicine	2.2%	6.9%	4%	6%

Minnesota Department of Transportation Office of Civil Rights Contractor Employment Data			1. Contractor Name and Address: Phone: _____				
2. Employment Data a) Name: Last Name, First Name, MI		b) Social Security #	c) New Hire (Y or N)	d) Ethnicity	e) Gender (M or F)	f) Trade/Foreman, Supervisors, Managers	g) Level (A, J, or T)
1.							
2.							
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27.							

If you have submitted this form at any time during this calendar year, you do not need to submit another one.

INSTRUCTIONS FOR EEO-12 CONTRACTOR EMPLOYMENT DATA

This form should be submitted at the Pre-Con to the Project Engineer prior to the start of your first Mn/DOT construction project for the calendar year. (Prime and Subs)

1. Contractor Name and Address self-explanatory.
2. Employment Data information will coincide with your employment records.
 - 2a. Name should be listed First Name, Middle Initial, and Last Name. This will enable Mn/DOT EEO staff to readily identify individuals on all projects.
 - 2b. Social Security Number self-explanatory.
 - 2c. New Hire is to be indicated with a "Y" for Yes or an "N" for No. "New Hire" is an employee who has not worked for you in any capacity or on any other project within the current calendar year.
 - 2d. Ethnicity can be indicated by Black (B), Hispanic (H), American Indian/Alaskan Native (AI), Asian/Pacific Islander (AP), or White (W).
 - 2e. Gender is to be indicated with an "M" for Males or an "F" for Females.
 - 2f. Trade/Foreman, Supervisors, Managers self-explanatory. List trade that applies unless the employee fits one of the other three categories.
 - 2g. Level "A" is for an Apprentice, "J" is for a Journey Worker, and "T" is for a Mn/DOT approved Trainee.

If you have questions about filling out this form, contact the Office of Civil Rights at (651) 366-3073.
(Please make copies as you need them.)

This information can be submitted electronically via the web, through Mn/DOT's Work force Information Tracking Initiative (WITI) Program. To open a free account to gain access to WITI or to find out more about this possibility please contact Mn/DOT's Office of Civil Rights at (651) 366-3321.

Minnesota Department of Transportation Office of Civil Rights Monthly Employment Compliance Report EEO-13				1. SP <input type="checkbox"/> SAP <input type="checkbox"/> (Check one) SP# _____		3. Contractor Name: _____ Federal Tax ID: _____ Street Address: _____ County or City _____ State _____ Zip _____		4. Prime <input type="checkbox"/> Subcontractor <input type="checkbox"/> (check one)									
2. Reporting Period _____ to _____				5. Dollar Amount of Contract: _____ 6. Percent of Completion: _____													
7. Employment Data a) Name: Last, First Middle Initial				b) Social Security # _____		c) New Hire (Y or N)		d) Ethnicity _____		e) Gender M or F		Trade/Foreman, Supervisors, Managers _____		g) Level (A, J or T)		h) Hours Worked This Period _____	
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8. Contract Goals				9. Prepared by: (Signature)				10. Reviewed by: (Signature)			
MINNESOTA GOALS		% OBTAINED		Print Name: _____ Title: _____ Date: _____ Phone: _____ Fax: _____				Print Name: _____ Title: _____ Date: _____ Phone: _____ Fax: _____			
% Minority	%	%									
% Women	%	%									

INSTRUCTIONS FOR EEO-13

MONTHLY EMPLOYMENT COMPLIANCE REPORT

- 1.-5. Self-explanatory – State Project #, county project is located in, are you a prime or sub, and contract value.
6. Percent of Completion is the estimated percentage of work completed including this reporting period.
7. Employment Data information will coincide with your employment records. All professional, supervisory and managerial hours actually worked on the project site must be included, whether or not they appear on the certified payroll.
 - 7a. Name should be listed Last Name, First Name, and Middle Initial. This will enable Mn/DOT EEO staff to readily identify individuals on all projects.
 - 7b. Social Security Number self-explanatory.
 - 7c. New Hire is to be indicated with a “Y” for Yes or an “N” for No. “New Hire” is an employee who has not worked for you in any capacity or on any other project within the current calendar year.
 - 7d. Ethnicity can be indicated by Black (B), Hispanic (H), American Indian/Alaskan Native (AI), Asian/Pacific Islander (AP), or White (W).
 - 7e. Gender is to be indicated with an “M” for Males or an “F” for Females.
 - 7f. Trade/Foreman, Supervisors, Managers list the trade that applies unless the employee fits one of the other three categories.
 - 7g. Level “A” is for an Apprentice, “J” is for a Journey Worker, and “T” is for a Mn/DOT approved Trainee.
 - 7h. Hours Worked for This Period will be all hours worked by the individual, for each trade, during the specified reporting period.
8. Contract Goals are the percent of total project hours to be worked by minority and women employees. The goals are determined by the geographic location and source of funding for the project. Projects in excess of \$100,000 with any State funding must meet the State Employment Goals. Projects in excess of \$10,000 with any Federal funding must meet the Federal Employment Goals. (See chart on EEO Pages 15-16.) Minority and women employee hours shall be distributed evenly throughout the length of the project and in every trade and craft that performs work on the project.

% Obtained is the percent of the total project hours worked by minority and women employees, up to and including this reporting period.
9. Prepared by Contractor Designee is the signature of the prime or subcontractor’s EEO officer/designee.
10. Reviewed by Project Engineer is the signature of the Mn/DOT staff monitoring the project.

If you have questions about filling out this form, contact the Office of Civil Rights at (651) 366-3073.
(Please make copies as you need them.)

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EEO COMPLIANCE REVIEW REPORT

Total Company Workforce in the State of Minnesota
(For 12 Month Period Preceding July 30th of the previous year)

Name and Address of Contractor

Name and Title of Corporate Officer

Name of EEO Officer

Job Categories	Total Employees		Total Minorities		Blacks		Asian/ Pacific Is.		American Indian		Hispanic		On-the-Job Trainees	
	M	F	M	F	M	F	M	F	M	F	M	F	M	F
Officials (Mangers)														
Supervisors														
Foremen/Women														
Clerical (field)														
Equipment Operators														
Mechanics														
Truck Drivers														
Iron Workers														
Carpenters														
Cement Masons														
Electricians														
Pipefitters & Plumbers														
Painters														
Laborers														
Total														
On-the-Job Trainees														



MINNESOTA DEPARTMENT OF TRANSPORTATION
ON-THE-JOB TRAINING PROGRAM
TRAINEE ASSIGNMENT

SP #: _____ Location: _____ District: _____

Project Engineer: _____ Phone: () _____

Prime Contractor: _____ Phone: () _____

Address: _____

City: _____ State: _____ Zip: _____

EEO Officer: _____ Project Manager: _____

Tel: _____

Training Contractor: _____ Phone: () _____

Address: _____

City: _____ State: _____ Zip: _____

EEO Officer: _____ Project Manager: _____

Tel: _____

TRAINEE

Job Title or Trade Classification: _____ Number of Training Hours on this Project: _____

Name: _____ S.S.#: _____

Address: _____ Phone: () _____

City: _____ State: _____ Zip: _____

EEO Officer: _____ Project Manager: _____

Tel: _____

Approximate Start Date: _____

Approximate Completion Date: _____

Is the trainee a member of a certified apprenticeship program?

If YES, verify with Apprenticeship Form or Indenture Number: _____

1. Ethnic Background: **Hispanic** _____; **Black** _____; **Asian/Pacific Islander** _____; **White** _____;
 Am. Ind/Alaskan _____ (Verify with Tribal I.D. # or Affiliation _____).

2. **Male**; _____ **Female**; _____.

MINNESOTA DEPARTMENT OF TRANSPORTATION
OFFICE OF CIVIL RIGHTS CERTIFICATION OF ON-THE-JOB TRAINING HOURS
FEDERAL-AID-PROJECTS

Contractor: submit original and one copy monthly to the project engineer

CONTRACTOR			REPORTING PERIOD:
ADDRESS			S.P. NO. (LOW):
			F.P. NO.:

TRAINEE	HOURS WORKED PREVIOUSLY	HOURS WORKED THIS PERIOD	TOTAL HOURS TO DATE

AMOUNT OF CLAIM _____ HOURS @ _____ PER HOUR = \$ _____

Progress of Trainee(s) ☐ Excellent ☐ Very Good ☐ Good ☐ Below Good

COMMENTS (Please detail any supplementary training offered):

CONTRACTOR:

The undersigned contractor hereby certifies that the listed employees are bonafide trainees as required by the On-the-Job Training Special Provision and that they have worked the hours as reported above.

Contractor Signature/Title

Date

PROJECT ENGINEER:

I hereby certify that the On-the-Job training hours reported above have been reviewed and found correct.

Engineer Signature/Title

Date



Minnesota Department of Transportation
Office of Civil Rights
On-the-Job Training (OJT) Program Approval Form

EEO Special Provisions
Revised 05/10

The Special Provisions of the contract clearly indicate that training and upgrading of minorities and women toward Journey worker status is the primary objective of the training provisions.

We,		, submit the following training program for (Trade) for approval.
	(Name of Contractor)	

I. Project Information

Contractor Name	S.P. #	County	Prime	Sub
Address	City	State	Zip	
Contact Person/ EEO Officer		Phone #	e-mail address	
Project Goals				
Trainees	Hours			

II. Project Training Plan Information

Trade	# of Trainees Projected	Hourly Assignment per Trainee	Estimated Start Date	Estimated End Date	Recruiting Resource

Planned Training Activities

III. Contractor Acknowledgment Statement.

I understand and will comply fully with the plans and specifications under which this training is being performed, and will report subsequent revisions to the training program as changes occur.

Contractor's Representative Signature	Title	Date

IV. Instruction for the Contractor.

The contractor's proposed training programs must be documented on this form and submitted as indicated in the Proposal. Your Company's compliance with this specification will factor into any and all employment related "Good Faith Effort" determinations.



MINNESOTA DEPARTMENT OF TRANSPORTATION
OFFICE OF CIVIL RIGHTS

EEO Special Provisions
Revised 05/10

**On- the -Job Training Program
Trainee Termination Form**

Contractor Name		County	Prime	Sub
Address	City	State	Zip	
EEO Officer		Phone #	e-mail address	
Trainee Name		Phone #	Social Security No.	
Address	City	State	Zip	
Race/Ethnicity				
<input type="checkbox"/> Hispanic		<input type="checkbox"/> White		<input type="checkbox"/> Asian
<input type="checkbox"/> Black		<input type="checkbox"/> American Indian		<input type="checkbox"/> Other
Gender		Classification/Trade		S.P. #
<input type="checkbox"/> Female	<input type="checkbox"/> Male			
Start Date	Termination Date	Hours Assigned	Hrs Completed	

Reason for Termination/Separation/Layoff:

<input type="checkbox"/> Construction phase completed
<input type="checkbox"/> Death
<input type="checkbox"/> Fired (please explain below)
<input type="checkbox"/> Illness/health problems
<input type="checkbox"/> Lack of transportation and /or travel distance
<input type="checkbox"/> Military duty
<input type="checkbox"/> Relocated
<input type="checkbox"/> Personal
<input type="checkbox"/> Quit to work for another company
<input type="checkbox"/> Other (please explain below)

Please provide comments:

--

Contractor's Representative Signature

Title

Date

MAIL or Fax THE ORIGINAL and MAINTAIN COPY:

395 John Ireland Boulevard

St. Paul, MN 55155-1899

Office of Civil Rights M.S. 170

On-The -Job Training Coordinator

Fax # 651/366-3129

**REQUIRED CONTRACT PROVISIONS
FEDERAL-AID CONSTRUCTION CONTRACTS**

Form-1273

(52 FR 36920, October 2, 1987, revised October 21, 1993, FHWA Electronic Version March 10, 1994)

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I. GENERAL

1. These contract provisions shall apply to all work performed on the contract by the contractor's own organization and with the assistance of workers under the contractor's immediate superintendence and to all work performed on the contract by piecework, station work, or by subcontract.

2. Except as otherwise provided for in each section, the contractor shall insert in each subcontract all of the stipulations contained in these Required Contract Provisions, and further require their inclusion in any lower tier subcontract or purchase order that may in turn be made. The Required Contract Provisions shall not be incorporated by reference in any case. The prime contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with these Required Contract Provisions.

3. A breach of any of the stipulations contained in these Required Contract Provisions shall be sufficient grounds for termination of the contract.

4. A breach of the following clauses of the Required Contract Provisions may also be grounds for debarment as provided in 29 CFR 5.12:

- Section I, paragraph 2;
- Section IV, paragraphs 1, 2, 3, 4, and 7;
- Section V, paragraphs 1 and 2a through 2g.

5. Disputes arising out of the labor standards provisions of Section IV (except paragraph 5) and Section V of these Required Contract Provisions shall not be subject to the general disputes clause of this contract.

Such disputes shall be resolved in accordance with the procedures of the U.S. Department of Labor (DOL) as set forth in 29 CFR 5, 6, and 7. Disputes within the meaning of this clause include disputes between the contractor (or any of its subcontractors) and the contracting agency, the DOL, or the contractor's employees or their representatives.

6. Selection of Labor: During the performance of this contract, the contractor shall not:

- a. discriminate against labor from any other State, possession, or territory of the United States (except for employment preference for Appalachian contracts, when applicable, as specified in Attachment A), or
- b. employ convict labor for any purpose within the limits of the project unless it is labor performed by convicts who are on parole, supervised release, or probation.

II. NONDISCRIMINATION

(Applicable to all Federal-aid construction contracts and to all related subcontracts of \$10,000 or more.)

1. Equal Employment Opportunity:

Equal employment opportunity (EEO) requirements not to discriminate and to take affirmative action to assure equal opportunity as set forth under laws, executive orders, rules, regulations (28 CFR 35, 29 CFR 1630 and 41 CFR 60) and orders of the Secretary of Labor as modified by the provisions prescribed herein, and imposed pursuant to 23 U.S.C. 140 shall constitute the EEO and specific affirmative action standards for the contractor's project activities under this contract. The Equal Opportunity Construction Contract Specifications set forth under 41 CFR 60-4.3 and the provisions of the American Disabilities Act of 1990 (42 U.S.C. 12101 et seq.) set forth under 28 CFR 35 and 29 CFR 1630 are incorporated by reference in this contract. In the execution of this contract, the contractor agrees to comply with the following minimum specific requirement activities of EEO:

- a. The contractor will work with the State highway agency (SHA) and the Federal Government in carrying out EEO obligations and in their review of his/her activities under the contract.
- b. The contractor will accept as his operating policy the following statement:

"It is the policy of this Company to assure that applicants are employed, and that employees are treated during employment, without regard to their race, religion, sex, color, national origin, age or disability. Such action shall include: employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship, preapprenticeship, and/or on-the-job training."

REQUIRED CONTRACT PROVISIONS (con't)

2. EEO Officer:

The contractor will designate and make known to the SHA contracting officers an EEO Officer who will have the responsibility for and must be capable of effectively administering and promoting an active contractor program of EEO and who must be assigned adequate authority and responsibility to do so.

3. Dissemination of Policy:

All members of the contractor's staff who are authorized to hire, supervise, promote, and discharge employees, or who recommend such action, or who are substantially involved in such action, will be made fully cognizant of, and will implement, the contractor's EEO policy and contractual responsibilities to provide EEO in each grade and classification of employment. To ensure that the above agreement will be met, the following actions will be taken as a minimum:

- a. Periodic meetings of supervisory and personnel office employees will be conducted before the start of work and then not less often than once every six months, at which time the contractor's EEO policy and its implementation will be reviewed and explained. The meetings will be conducted by the EEO Officer.
- b. All new supervisory or personnel office employees will be given a thorough indoctrination by the EEO Officer, covering all major aspects of the contractor's EEO obligations within thirty days following their reporting for duty with the contractor.
- c. All personnel who are engaged in direct recruitment for the project will be instructed by the EEO Officer in the contractor's procedures for locating and hiring minority group employees.
- d. Notices and posters setting forth the contractor's EEO policy will be placed in areas readily accessible to employees, applicants for employment and potential employees.
- e. The contractor's EEO policy and the procedures to implement such policy will be brought to the attention of employees by means of meetings, employee handbooks, or other appropriate means.

4. Recruitment:

When advertising for employees, the contractor will include in all advertisements for employees the notation: "An Equal Opportunity Employer." All such advertisements will be placed in publications having a large circulation among minority groups in the area from which the project work force would normally be derived.

- a. The contractor will, unless precluded by a valid bargaining agreement, conduct systematic and direct recruitment through public and private employee referral sources likely to yield qualified minority group applicants. To meet this requirement, the contractor will identify sources of potential minority group employees, and establish with such identified sources procedures whereby minority group applicants may be referred to the contractor for employment consideration.
- b. In the event the contractor has a valid bargaining agreement providing for exclusive hiring hall referrals,

he is expected to observe the provisions of that agreement to the extent that the system permits the contractor's compliance with EEO contract provisions.

(The DOL has held that where implementation of such agreements have the effect of discriminating against minorities or women, or obligates the contractor to do the same, such implementation violates Executive Order 11246, as amended.)

- c. The contractor will encourage his present employees to refer minority group applicants for employment. Information and procedures with regard to referring minority group applicants will be discussed with employees.

5. Personnel Actions:

Wages, working conditions, and employee benefits shall be established and administered, and personnel actions of every type, including hiring, upgrading, promotion, transfer, demotion, layoff, and termination, shall be taken without regard to race, color, religion, sex, national origin, age or disability. The following procedures shall be followed:

- a. The contractor will conduct periodic inspections of project sites to insure that working conditions and employee facilities do not indicate discriminatory treatment of project site personnel.
- b. The contractor will periodically evaluate the spread of wages paid within each classification to determine any evidence of discriminatory wage practices.
- c. The contractor will periodically review selected personnel actions in depth to determine whether there is evidence of discrimination. Where evidence is found, the contractor will promptly take corrective action. If the review indicates that the discrimination may extend beyond the actions reviewed, such corrective action shall include all affected persons.
- d. The contractor will promptly investigate all complaints of alleged discrimination made to the contractor in connection with his obligations under this contract, will attempt to resolve such complaints, and will take appropriate corrective action within a reasonable time. If the investigation indicates that the discrimination may affect persons other than the complainant, such corrective action shall include such other persons. Upon completion of each investigation, the contractor will inform every complainant of all of his avenues of appeal.

6. Training and Promotion:

- a. The contractor will assist in locating, qualifying, and increasing the skills of minority group and women employees, and applicants for employment.
- b. Consistent with the contractor's work force requirements and as permissible under Federal and State regulations, the contractor shall make full use of training programs, i.e., apprenticeship, and on-the-job training programs for the geographical area of contract performance. Where feasible, 25 percent of apprentices or trainees in each occupation shall be in their first year of apprenticeship or training. In the event a special provision for training is provided under

REQUIRED CONTRACT PROVISIONS (con't)

this contract, this subparagraph will be superseded as indicated in the special provision.

c. The contractor will advise employees and applicants for employment of available training programs and entrance requirements for each.

d. The contractor will periodically review the training and promotion potential of minority group and women employees and will encourage eligible employees to apply for such training and promotion.

7. Unions:

If the contractor relies in whole or in part upon unions as a source of employees, the contractor will use his/her best efforts to obtain the cooperation of such unions to increase opportunities for minority groups and women within the unions, and to effect referrals by such unions of minority and female employees. Actions by the contractor either directly or through a contractor's association acting as agent will include the procedures set forth below:

a. The contractor will use best efforts to develop, in cooperation with the unions, joint training programs aimed toward qualifying more minority group members and women for membership in the unions and increasing the skills of minority group employees and women so that they may qualify for higher paying employment.

b. The contractor will use best efforts to incorporate an EEO clause into each union agreement to the end that such union will be contractually bound to refer applicants without regard to their race, color, religion, sex, national origin, age or disability.

c. The contractor is to obtain information as to the referral practices and policies of the labor union except that to the extent such information is within the exclusive possession of the labor union and such labor union refuses to furnish such information to the contractor, the contractor shall so certify to the SHA and shall set forth what efforts have been made to obtain such information.

d. In the event the union is unable to provide the contractor with a reasonable flow of minority and women referrals within the time limit set forth in the collective bargaining agreement, the contractor will, through independent recruitment efforts, fill the employment vacancies without regard to race, color, religion, sex, national origin, age or disability; making full efforts to obtain qualified and/or qualifiable minority group persons and women. (The DOL has held that it shall be no excuse that the union with which the contractor has a collective bargaining agreement providing for exclusive referral failed to refer minority employees.) In the event the union referral practice prevents the contractor from meeting the obligations pursuant to Executive Order 11246, as amended, and these special provisions, such contractor shall immediately notify the SHA.

8. Selection of Subcontractors, Procurement of Materials and Leasing of Equipment:

The contractor shall not discriminate on the grounds of race, color, religion, sex, national origin, age or disability in the selection

and retention of subcontractors, including procurement of materials and leases of equipment.

a. The contractor shall notify all potential subcontractors and suppliers of his/her EEO obligations under this contract.

b. Disadvantaged business enterprises (DBE), as defined in 49 CFR 23, shall have equal opportunity to compete for and perform subcontracts which the contractor enters into pursuant to this contract. The contractor will use his best efforts to solicit bids from and to utilize DBE subcontractors or subcontractors with meaningful minority group and female representation among their employees. Contractors shall obtain lists of DBE construction firms from SHA personnel.

c. The contractor will use his best efforts to ensure subcontractor compliance with their EEO obligations.

9. Records and Reports:

The contractor shall keep such records as necessary to document compliance with the EEO requirements. Such records shall be retained for a period of three years following completion of the contract work and shall be available at reasonable times and places for inspection by authorized representatives of the SHA and the FHWA.

a. The records kept by the contractor shall document the following:

(1) The number of minority and non-minority group members and women employed in each work classification on the project;

(2) The progress and efforts being made in cooperation with unions, when applicable, to increase employment opportunities for minorities and women;

(3) The progress and efforts being made in locating, hiring, training, qualifying, and upgrading minority and female employees; and

(4) The progress and efforts being made in securing the services of DBE subcontractors or subcontractors with meaningful minority and female representation among their employees.

b. The contractors will submit an annual report to the SHA each July for the duration of the project, indicating the number of minority, women, and non-minority group employees currently engaged in each work classification required by the contract work. This information is to be reported on Form PR-1391. If on-the-job training is being required by special provision, the contractor will be required to collect and report training data.

III. NONSEGREGATED FACILITIES

(Applicable to all Federal-aid construction contracts and to all related subcontracts of \$10,000 or more.)

a. By submission of this bid, the execution of this contract or subcontract, or the consummation of this material supply agreement or purchase order, as appropriate, the bidder, Federal-aid construction contractor, subcontractor, material supplier, or vendor, as appropriate, certifies that the firm

MINNESOTA DEPARTMENT OF TRANSPORTATION
OFFICE OF CIVIL RIGHTS
REQUIRED CONTRACT PROVISIONS (con't)

EEO Special Provisions
Revised 05/10

does not maintain or provide for its employees any segregated facilities at any of its establishments, and that the firm does not permit its employees to perform their services at any location, under its control, where segregated facilities are maintained. The firm agrees that a breach of this certification is a violation of the EEO provisions of this contract. The firm further certifies that no employee will be denied access to adequate facilities on the basis of sex or disability.

b. As used in this certification, the term "segregated facilities" means any waiting rooms, work areas, restrooms and washrooms, restaurants and other eating areas, time clocks, locker rooms, and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing facilities provided for employees which are segregated by explicit directive, or are, in fact, segregated on the basis of race, color, religion, national origin, age or disability, because of habit, local custom, or otherwise. The only exception will be for the disabled when the demands for accessibility override (e.g. disabled parking).

c. The contractor agrees that it has obtained or will obtain identical certification from proposed subcontractors or material suppliers prior to award of subcontracts or consummation of material supply agreements of \$10,000 or more and that it will retain such certifications in its files.

IV. PAYMENT OF PREDETERMINED MINIMUM WAGE

(Applicable to all Federal-aid construction contracts exceeding \$2,000 and to all related subcontracts, except for projects located on roadways classified as local roads or rural minor collectors, which are exempt.)

1. General:

a. All mechanics and laborers employed or working upon the site of the work will be paid unconditionally and not less often than once a week and without subsequent deduction or rebate on any account (except such payroll deductions as are permitted by regulations (29 CFR 3) issued by the Secretary of Labor under the Copeland Act (40 U.S.C. 276c) the full amounts of wages and bona fide fringe benefits (or cash equivalents thereof) due at time of payment. The payment shall be computed at wage rates not less than those contained in the wage determination of the Secretary of Labor (hereinafter "the wage determination") which is attached hereto and made a part hereof, regardless of any contractual relationship which may be alleged to exist between the contractor or its subcontractors and such laborers and mechanics. The wage determination (including any additional classifications and wage rates conformed under paragraph 2 of this Section IV and the DOL poster (WH-1321) or Form FHWA-1495) shall be posted at all times by the contractor and its subcontractors at the site of the work in a prominent and accessible place where it can be easily seen by the workers. For the purpose of this Section, contributions made or costs reasonably anticipated for bona fide fringe benefits under

Section 1(b)(2) of the Davis-Bacon Act (40 U.S.C. 276a) on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of Section IV, paragraph 3b, hereof. Also, for the purpose of this Section, regular contributions made or costs incurred for more than a weekly period (but not less often than quarterly) under plans, funds, or programs, which cover the particular weekly period, are deemed to be constructively made or incurred during such weekly period. Such laborers and mechanics shall be paid the appropriate wage rate and fringe benefits on the wage determination for the classification of work actually performed, without regard to skill, except as provided in paragraphs 4 and 5 of this Section IV.

b. Laborers or mechanics performing work in more than one classification may be compensated at the rate specified for each classification for the time actually worked therein, provided, that the employer's payroll records accurately set forth the time spent in each classification in which work is performed.

c. All rulings and interpretations of the Davis-Bacon Act and related acts contained in 29 CFR 1, 3, and 5 are herein incorporated by reference in this contract.

2. Classification:

a. The SHA contracting officer shall require that any class of laborers or mechanics employed under the contract, which is not listed in the wage determination, shall be classified in conformance with the wage determination.

b. The contracting officer shall approve an additional classification, wage rate and fringe benefits only when the following criteria have been met:

- (1) the work to be performed by the additional classification requested is not performed by a classification in the wage determination;
- (2) the additional classification is utilized in the area by the construction industry;
- (3) the proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination; and
- (4) with respect to helpers as defined in Section IV.4(c), when such a classification prevails in the area in which the work is performed.

c. If the contractor or subcontractors, as appropriate, the laborers and mechanics (if known) to be employed in the additional classification or their representatives, and the contracting officer agree on the classification and wage rate (including the amount designated for fringe benefits where appropriate), a report of the action taken shall be sent by the contracting officer to the DOL, Administrator of the Wage and Hour Division, Employment Standards Administration, Washington, D.C. 20210. The Wage and Hour Administrator, or an authorized representative, will approve, modify, or disapprove every additional classification action within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.

REQUIRED CONTRACT PROVISIONS (con't)

d. In the event the contractor or subcontractors, as appropriate, the laborers or mechanics to be employed in the additional classification or their representatives, and the contracting officer do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits, where appropriate), the contracting officer shall refer the questions, including the views of all interested parties and the recommendation of the contracting officer, to the Wage and Hour Administrator for determination. Said Administrator, or an authorized representative, will issue a determination within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.

e. The wage rate (including fringe benefits where appropriate) determined pursuant to paragraph 2c or 2d of this Section IV shall be paid to all workers performing work in the additional classification from the first day on which work is performed in the classification.

3. Payment of Fringe Benefits:

a. Whenever the minimum wage rate prescribed in the contract for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly rate, the contractor or subcontractors, as appropriate, shall either pay the benefit as stated in the wage determination or shall pay another bona fide fringe benefit or an hourly case equivalent thereof.

b. If the contractor or subcontractor, as appropriate, does not make payments to a trustee or other third person, he/she may consider as a part of the wages of any laborer or mechanic the amount of any costs reasonably anticipated in providing bona fide fringe benefits under a plan or program, provided, that the Secretary of Labor has found, upon the written request of the contractor, that the applicable standards of the Davis-Bacon Act have been met. The Secretary of Labor may require the contractor to set aside in a separate account assets for the meeting of obligations under the plan or program.

4. Apprentices and Trainees (Programs of the U.S. DOL):

a. Apprentices:

(1) Apprentices will be permitted to work at less than the predetermined rate for the work they performed when they are employed pursuant to and individually registered in a bona fide apprenticeship program registered with the DOL, Employment and Training Administration, Bureau of Apprenticeship and Training, or with a State apprenticeship agency recognized by the Bureau, or if a person is employed in his/her first 90 days of probationary employment as an apprentice in such an apprenticeship program, who is not individually registered in the program, but who has been certified by the Bureau of Apprenticeship and Training or a State apprenticeship agency (where appropriate) to be eligible for probationary employment as an apprentice.

(2) The allowable ratio of apprentices to journeyman-level employees on the job site in any craft classification shall not be greater than the ratio permitted to the contractor as to the entire work force under the registered program. Any employee listed on a payroll at an apprentice wage rate, who is not registered or otherwise employed as stated above, shall be paid not less than the applicable wage rate listed in the wage determination for the classification of work actually performed. In addition, any apprentice performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. Where a contractor or subcontractor is performing construction on a project in a locality other than that in which its program is registered, the ratios and wage rates (expressed in percentages of the journeyman-level hourly rate) specified in the contractor's or subcontractor's registered program shall be observed.

(3) Every apprentice must be paid at not less than the rate specified in the registered program for the apprentice's level of progress, expressed as a percentage of the journeyman-level hourly rate specified in the applicable wage determination. Apprentices shall be paid fringe benefits in accordance with the provisions of the apprenticeship program. If the apprenticeship program does not specify fringe benefits, apprentices must be paid the full amount of fringe benefits listed on the wage determination for the applicable classification. If the Administrator for the Wage and Hour Division determines that a different practice prevails for the applicable apprentice classification, fringes shall be paid in accordance with that determination.

(4) In the event the Bureau of Apprenticeship and Training, or a State apprenticeship agency recognized by the Bureau, withdraws approval of an apprenticeship program, the contractor or subcontractor will no longer be permitted to utilize apprentices at less than the applicable predetermined rate for the comparable work performed by regular employees until an acceptable program is approved.

b. Trainees:

(1) Except as provided in 29 CFR 5.16, trainees will not be permitted to work at less than the predetermined rate for the work performed unless they are employed pursuant to and individually registered in a program which has received prior approval, evidenced by formal certification by the DOL, Employment and Training Administration.

(2) The ratio of trainees to journeyman-level employees on the job site shall not be greater than permitted under the plan approved by the Employment and Training Administration. Any employee listed on the payroll at a trainee rate that is not registered and participating in a training plan approved by the Employment and Training

REQUIRED CONTRACT PROVISIONS (con't)

Administration shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any trainee performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed.

(3) Every trainee must be paid at not less than the rate specified in the approved program for his/her level of progress, expressed as a percentage of the journeyman-level hourly rate specified in the applicable wage determination. Trainees shall be paid fringe benefits in accordance with the provisions of the trainee program. If the trainee program does not mention fringe benefits, trainees shall be paid the full amount of fringe benefits listed on the wage determination unless the Administrator of the Wage and Hour Division determines that there is an apprenticeship program associated with the corresponding journeyman-level wage rate on the wage determination which provides for less than full fringe benefits for apprentices, in which case such trainees shall receive the same fringe benefits as apprentices.

(4) In the event the Employment and Training Administration withdraws approval of a training program, the contractor or subcontractor will no longer be permitted to utilize trainees at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

c. Helpers:

Helpers will be permitted to work on a project if the helper classification is specified and defined on the applicable wage determination or is approved pursuant to the conformance procedure set forth in Section IV.2. Any worker listed on a payroll at a helper wage rate, who is not a helper under an approved definition, shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed.

5. Apprentices and Trainees (Programs of the U.S. DOT):

Apprentices and trainees working under apprenticeship and skill training programs which have been certified by the Secretary of Transportation as promoting EEO in connection with Federal-aid highway construction programs are not subject to the requirements of paragraph 4 of this Section IV. The straight time hourly wage rates for apprentices and trainees under such programs will be established by the particular programs. The ratio of apprentices and trainees to journeymen shall not be greater than permitted by the terms of the particular program.

6. Withholding:

The SHA shall upon its own action or upon written request of an authorized representative of the DOL withhold, or cause to be withheld, from the contractor or subcontractor under this contract or any other Federal contract with the same prime contractor, or any other Federally-assisted contract subject to Davis-Bacon prevailing

wage requirements which is held by the same prime contractor, as much of the accrued payments or advances as may be considered necessary to pay laborers and mechanics, including apprentices, trainees, and helpers, employed by the contractor or any subcontractor the full amount of wages required by the contract. In the event of failure to pay any laborer or mechanic, including any apprentice, trainee, or helper, employed or working on the site of the work, all or part of the wages required by the contract, the SHA contracting officer may, after written notice to the contractor, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds until such violations have ceased.

7. Overtime Requirements:

No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers, mechanics, watchmen, or guards (including apprentices, trainees, and helpers described in paragraphs 4 and 5 above) shall require or permit any laborer, mechanic, watchman, or guard in any workweek in which he/she is employed on such work, to work in excess of 40 hours in such workweek unless such laborer, mechanic, watchman, or guard receives compensation at a rate not less than one-and-one-half times his/her basic rate of pay for all hours worked in excess of 40 hours in such workweek.

8. Violation:

Liability for Unpaid Wages; Liquidated Damages: In the event of any violation of the clause set forth in paragraph 7 above, the contractor and any subcontractor responsible thereof shall be liable to the affected employee for his/her unpaid wages. In addition, such contractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory) for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer, mechanic, watchman, or guard employed in violation of the clause set forth in paragraph 7, in the sum of \$10 for each calendar day on which such employee was required or permitted to work in excess of the standard work week of 40 hours without payment of the overtime wages required by the clause set forth in paragraph 7.

9. Withholding for Unpaid Wages and Liquidated Damages:

The SHA shall upon its own action or upon written request of any authorized representative of the DOL withhold, or cause to be withheld, from any monies payable on account of work performed by the contractor or subcontractor under any such contract or any other Federal contract with the same prime contractor, or any other Federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same prime contractor, such sums as may be determined to be necessary to satisfy any liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in paragraph 8 above.

REQUIRED CONTRACT PROVISIONS (con't)

V. STATEMENTS AND PAYROLLS

(Applicable to all Federal-aid construction contracts exceeding \$2,000 and to all related subcontracts, except for projects located on roadways classified as local roads or rural collectors, which are exempt.)

1. Compliance with Copeland Regulations (29 CFR 3):

The contractor shall comply with the Copeland Regulations of the Secretary of Labor which are herein incorporated by reference.

2. Payrolls and Payroll Records:

a. Payrolls and basic records relating thereto shall be maintained by the contractor and each subcontractor during the course of the work and preserved for a period of 3 years from the date of completion of the contract for all laborers, mechanics, apprentices, trainees, watchmen, helpers, and guards working at the site of the work.

b. The payroll records shall contain the name, social security number, and address of each such employee; his or her correct classification; hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalent thereof the types described in Section 1(b)(2)(B) of the Davis Bacon Act); daily and weekly number of hours worked; deductions made; and actual wages paid. In addition, for Appalachian contracts, the payroll records shall contain a notation indicating whether the employee does, or does not, normally reside in the labor area as defined in Attachment A, paragraph 1. Whenever the Secretary of Labor, pursuant to Section IV, paragraph 3b, has found that the wages of any laborer or mechanic include the amount of any costs reasonably anticipated in providing benefits under a plan or program described in Section 1(b)(2)(B) of the Davis Bacon Act, the contractor and each subcontractor shall maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially possible, that the plan or program has been communicated in writing to the laborers or mechanics affected, and show the cost anticipated or the actual cost incurred in providing benefits. Contractors or subcontractors employing apprentices or trainees under approved programs shall maintain written evidence of the registration of apprentices and trainees, and ratios and wage rates prescribed in the applicable programs.

c. Each contractor and subcontractor shall furnish, each week in which any contract work is performed, to the SHA resident engineer a payroll of wages paid each of its employees (including apprentices, trainees, and helpers, described in Section IV, paragraphs 4 and 5, and watchmen and guards engaged on work during the preceding weekly payroll period).

The payroll submitted shall set out accurately and completely all of the information required to be maintained under paragraph 2b of this Section V. This information may be submitted in any form desired. Optional Form WH-347 is available for this purpose and may be purchased from the Superintendent of Documents (Federal stock number 029-005-0014-1), U.S. Government Printing Office, Washington, D.C. 20402. The prime contractor is responsible for the submission

of copies of payrolls by all subcontractors.

d. Each payroll submitted shall be accompanied by a "Statement of Compliance," signed by the contractor or subcontractor or his/her agent who pays or supervises the payment of the persons employed under the contract and shall certify the following:

(1) that the payroll for the payroll period contains the information required to be maintained under paragraph 2b of this Section V and that such information is correct and complete;

(2) that such laborer or mechanic (including each helper, apprentice, and trainee) employed on the contract during the payroll period has been paid the full weekly wages earned, without rebate, either directly or indirectly, and that no deductions have been made either directly or indirectly from the full wages earned, other than permissible deductions as set forth in the Regulations, 29 CFR 3;

(3) that each laborer or mechanic has been paid not less than the applicable wage rate and fringe benefits or cash equivalent for the classification of work performed, as specified in the applicable wage determination incorporated into the contract.

e. The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH-347 shall satisfy the requirement for submission of the "Statement of Compliance" required by paragraph 2d of this Section V.

f. The falsification of any of the above certifications may subject the contractor to civil or criminal prosecution under 18 U.S.C. 1001 and 31 U.S.C. 231.

g. The contractor or subcontractor shall make the records required under paragraph 2b of this Section V available for inspection, copying, or transcription by authorized representatives of the SHA, the FHWA, or the DOL, and shall permit such representatives to interview employees during working hours on the job. If the contractor or subcontractor fails to submit the required records or to make them available, the SHA, the FHWA, the DOL, or all may, after written notice to the contractor, sponsor, applicant, or owner, take such actions as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds. Furthermore, failure to submit the required records upon request or to make such records available may be grounds for debarment action pursuant to 29 CFR 5.12.

VI. RECORD OF MATERIALS, SUPPLIES, AND LABOR

1. On all Federal-aid contracts on the National Highway System, except those which provide solely for the installation of protective devices at railroad grade crossings, those which are constructed on a force account or direct labor basis, highway beautification contracts, and contracts for which the total final construction cost for roadway and bridge is less than \$1,000,000 (23 CFR 635) the contractor shall:

REQUIRED CONTRACT PROVISIONS (con't)

- a. Become familiar with the list of specific materials and supplies contained in Form FHWA-47, "Statement of Materials and Labor Used by Contractor of Highway Construction Involving Federal Funds," prior to the commencement of work under this contract.
- b. Maintain a record of the total cost of all materials and supplies purchased for and incorporated in the work, and also of the quantities of those specific materials and supplies listed on Form FHWA-47, and in the units shown on Form FHWA-47.
- c. Furnish, upon the completion of the contract, to the SHA resident engineer on Form FHWA-47 together with the data required in paragraph 1b relative to materials and supplies, a final labor summary of all contract work indicating the total hours worked and the total amount earned.

2. At the prime contractor's option, either a single report covering all contract work or separate reports for the contractor and for each subcontract shall be submitted.

VII. SUBLETTING OR ASSIGNING THE CONTRACT

1. The contractor shall perform with its own organization contract work amounting to not less than 30 percent (or a greater percentage if specified elsewhere in the contract) of the total original contract price, excluding any specialty items designated by the State. Specialty items may be performed by subcontract and the amount of any such specialty items performed may be deducted from the total original contract price before computing the amount of work required to be performed by the contractor's own organization (23 CFR 635).

- a. "Its own organization" shall be construed to include only workers employed and paid directly by the prime contractor and equipment owned or rented by the prime contractor, with or without operators. Such term does not include employees or equipment of a subcontractor, assignee, or agent of the prime contractor.
- b. "Specialty Items" shall be construed to be limited to work that requires highly specialized knowledge, abilities, or equipment not ordinarily available in the type of contracting organizations qualified and expected to bid on the contract as a whole and in general are to be limited to minor components of the overall contract.

2. The contract amount upon which the requirements set forth in paragraph 1 of Section VII is computed includes the cost of material and manufactured products which are to be purchased or produced by the contractor under the contract provisions.

3. The contractor shall furnish (a) a competent superintendent or supervisor who is employed by the firm, has full authority to direct performance of the work in accordance with the contract requirements, and is in charge of all construction operations (regardless

of who performs the work) and (b) such other of its own organizational resources (supervision, management, and engineering services) as the SHA contracting officer determines is

necessary to assure the performance of the contract.

4. No portion of the contract shall be sublet, assigned or otherwise disposed of except with the written consent of the SHA contracting officer, or authorized representative, and such consent when given shall not be construed to relieve the contractor of any responsibility for the fulfillment of the contract. Written consent will be given only after the SHA has assured that each subcontract is evidenced in writing and that it contains all pertinent provisions and requirements of the prime contract.

VIII. SAFETY: ACCIDENT PREVENTION

1. In the performance of this contract the contractor shall comply with all applicable Federal, State, and local laws governing safety, health, and sanitation (23 CFR 635). The contractor shall provide all safeguards, safety devices and protective equipment and take any other needed actions as it determines, or as the SHA contracting officer may determine, to be reasonably necessary to protect the life and health of employees on the job and the safety of the public and to protect property in connection with the performance of the work covered by the contract.

2. It is a condition of this contract, and shall be made a condition of each subcontract, which the contractor enters into pursuant to this contract, that the contractor and any subcontractor shall not permit any employee, in performance of the contract, to work in surroundings or under conditions which are unsanitary, hazardous or dangerous to his/her health or safety, as determined under construction safety and health standards (29 CFR 1926) promulgated by the Secretary of Labor, in accordance with Section 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C. 333).

3. Pursuant to 29 CFR 1926.3, it is a condition of this contract that the Secretary of Labor or authorized representative thereof, shall have right of entry to any site of contract performance to inspect or investigate the matter of compliance with the construction safety and health standards and to carry out the duties of the Secretary under Section 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C. 333).

IX. FALSE STATEMENTS CONCERNING HIGHWAY PROJECTS

In order to assure high quality and durable construction in conformity with approved plans and specifications and a high degree of reliability on statements and representations made by engineers, contractors, suppliers, and workers on Federal-aid highway projects, it is essential that all persons concerned with the project perform their functions as carefully, thoroughly, and honestly as possible. Willful falsification, distortion, or misrepresentation with respect to any facts related to the project is a violation of Federal law.

To prevent any misunderstanding regarding the seriousness of these and similar acts, the following notice shall be posted on each Federal-aid highway project (23 CFR 635) in one or more places where it is readily available to all persons concerned with the project:

REQUIRED CONTRACT PROVISIONS (con't)

NOTICE TO ALL PERSONNEL ENGAGED ON FEDERAL-AID HIGHWAY PROJECTS

18 U.S.C. 1020 reads as follows:

*"Whoever being an officer, agent, or employee of the United States, of any State or Territory, or whoever, whether a person, association, firm, or corporation, knowingly makes any false statement, false representation, or false report as to the character, quality, quantity, or cost of the material used or to be used, or the quantity or quality of the work performed or to be performed, or the cost thereof in connection with the submission of plans, maps, specifications, contracts, or costs of construction on any highway or related project submitted for approval to the Secretary of Transportation; or Whoever knowingly makes any false statement, false representation, false report or false claim with respect to the character, quality, quantity, or cost of any work performed or to be performed, or materials furnished or to be furnished, in connection with the construction of any highway or related project approved by the Secretary of Transportation; or
Whoever knowingly makes any false statement or false representation as to material fact in any statement, certificate, or report submitted pursuant to provisions of the Federal-aid Roads Act approved July 1, 1916, (39 Stat. 355), as amended and supplemented;
Shall be fined not more than \$10,000 or imprisoned not more than 5 years or both."*

X. IMPLEMENTATION OF CLEAN AIR ACT AND FEDERAL WATER POLLUTION CONTROL ACT

(Applicable to all Federal-aid construction contracts and to all related subcontracts of \$100,000 or more.)

By submission of this bid or the execution of this contract, or subcontract, as appropriate, the bidder, Federal-aid construction contractor, or subcontractor, as appropriate, will be deemed to have stipulated as follows:

1. That any facility that is or will be utilized in the performance of this contract, unless such contract is exempt under the Clean Air Act, as amended (42 U.S.C. 1857 et seq., as amended by Pub.L. 91-604), and under the Federal Water Pollution Control Act, as amended (33 U.S.C. 1251 et seq., as amended by Pub.L. 92-500), Executive Order 11738, and regulations in implementation thereof (40 CFR 15) is not listed, on the date of contract award, on the U.S. Environmental Protection Agency (EPA) List of Violating Facilities pursuant to 40 CFR 15.20.

2. That the firm agrees to comply and remain in compliance with all the requirements of Section 114 of the Clean Air Act and Section 308 of the Federal Water Pollution Control Act and all regulations and guidelines listed there under.

3. That the firm shall promptly notify the SHA of the receipt of any communication from the Director, Office of Federal Activities, EPA, indicating that a facility that is or will be utilized for the contract is under consideration to be listed on the EPA List of

Violating Facilities.

4. That the firm agrees to include or cause to be included the requirements of paragraph 1 through 4 of this Section X in every nonexempt subcontract, and further agrees to take such action as the government may direct as a means of enforcing such requirements.

XI. CERTIFICATION REGARDING DEBARMENT, SUSPENSION, INELIGIBILITY AND VOLUNTARY EXCLUSION

1. Instructions for Certification - Primary Covered Transactions:

(Applicable to all Federal-aid contracts -49 CFR 29)

- a. By signing and submitting this proposal, the prospective primary participant is providing the certification set out below.
- b. The inability of a person to provide the certification set out below will not necessarily result in denial of participation in this covered transaction. The prospective participant shall submit an explanation of why it cannot provide the certification set out below. The certification or explanation will be considered in connection with the department or agency's determination whether to enter into this transaction. However, failure of the prospective primary participant to furnish a certification or an explanation shall disqualify such a person from participation in this transaction.
- c. The certification in this clause is a material representation of fact upon which reliance was placed when the department or agency determined to enter into this transaction. If it is later determined that the prospective primary participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the department or agency may terminate this transaction for cause of default.
- d. The prospective primary participant shall provide immediate written notice to the department or agency to whom this proposal is submitted if any time the prospective primary participant learns that its certification was erroneous when submitted or has become erroneous by reason of changed circumstances.
- e. The terms "covered transaction," "debarred," "suspended," "ineligible," "lower tier covered transaction," "participant," "person," "primary covered transaction," "principal," "proposal," and "voluntarily excluded," as used in this clause, have the meanings set out in the Definitions and Coverage sections of rules implementing Executive Order 12549. You may contact the department or agency to which this proposal is submitted for assistance in obtaining a copy of those regulations.
- f. The prospective primary participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency entering into this transaction.

MINNESOTA DEPARTMENT OF TRANSPORTATION
OFFICE OF CIVIL RIGHTS
REQUIRED CONTRACT PROVISIONS (con't)

EEO Special Provisions
Revised 05/10

g. The prospective primary participant further agrees by submitting this proposal that it will include the clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transaction," provided by the department or agency entering into this covered transaction, without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions.

h. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant may decide the method and frequency by which it determines the eligibility of its principals. Each participant may, but is not required to, check the nonprocurement portion of the "Lists of Parties Excluded From Federal Procurement or Nonprocurement Programs" (Nonprocurement List) which is compiled by the General Services Administration.

i. Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

j. Except for transactions authorized under paragraph f of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department or agency may terminate this transaction for cause or default.

Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion—Primary Covered Transactions

1. The prospective primary participant certifies to the best of its knowledge and belief, that it and its principals:

- a. Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any Federal department or agency;
- b. Have not within a 3-year period preceding this proposal been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft,

forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;

- c. Are not presently indicted for or otherwise criminally or

civily charged by a governmental entity (Federal, State or local) with commission of any of the offenses enumerated in paragraph 1b of this certification; and

- d. Have not within a 3-year period preceding this application/proposal had one or more public transactions (Federal, State or local) terminated for cause or default.

2. Where the prospective primary participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

2. Instructions for Certification - Lower Tier Covered Transactions:

(Applicable to all subcontracts, purchase orders and other lower tier transactions of \$25,000 or more - 49 CFR 29)

a. By signing and submitting this proposal, the prospective lower tier is providing the certification set out below.

b. The certification in this clause is a material representation of fact upon which reliance was placed when this transaction was entered into. If it is later determined that the prospective lower tier participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the department of agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.

c. The prospective lower tier participant shall provide immediate written notice to the person to which this proposal is submitted if at any time the prospective lower tier participant learns that its certification was erroneous by reason of changed circumstances.

d. The terms "covered transaction," "debarred," "suspended," "ineligible," "primary covered transaction," "participant," "person," "principal," "proposal," and "voluntarily excluded," as used in this clause, have the meanings set out in the Definitions and Coverage sections of rules implementing Executive Order 12549. You may contact the person to which this proposal is submitted for assistance in obtaining a copy of those regulations.

e. The prospective lower tier participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency with which this transaction originated.

f. The prospective lower tier participant further agrees by submitting this proposal that it will include this clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transaction," without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions.

REQUIRED CONTRACT PROVISIONS (con't)

g. A participation in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant may decide the method and frequency by which it determines the eligibility of its principals. Each participant may, but is not required to, check the Nonprocurement List.

h. Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

i. Except for transactions authorized under paragraph e of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.

attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.

2. This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by 31 U.S.C. 1352. Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.

3. The prospective participant also agrees by submitting his or her bid or proposal that he or she shall require that the language of this certification be included in all lower tier subcontracts, which exceed \$100,000 and that all such recipients shall certify and disclose accordingly.

Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transactions:

1. The prospective lower tier participant certifies, by submission of this proposal, that neither it nor its principals is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this transaction by any Federal department or agency.

2. Where the prospective lower tier participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

XII. CERTIFICATION REGARDING USE OF CONTRACT FUNDS FOR LOBBYING

(Applicable to all Federal-aid construction contracts and to all related subcontracts which exceed \$100,000 - 49 CFR 20)

1. The prospective participant certifies, by signing and submitting this bid or proposal, to the best of his or her knowledge and belief, that:

a. No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

b. If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or

APPENDIX A (Short Version)
REQUIRED CONTRACT PROVISIONS
FEDERAL-AID CONSTRUCTION CONTRACTS

The Required Contract Provisions for Federal-aid construction contracts, Form FHWA-1273 (Rev. 4-93) is restated here for emphasis:

Section IV. PAYMENT OF PREDETERMINED MINIMUM WAGE

Section IV.2, Classification

2. Classification

a. The SHA contracting officer shall require that any class of laborers or mechanics employed under the contract, which is not listed in the wage determination, shall be classified in conformance with the wage determination.

b. The contracting officer shall approve an additional classification, wage rate and fringe benefits only when the following criteria have been met:

(1) the work to be performed by the additional classification requested is not performed by a classification in the wage determination;

(2) the additional classification is utilized in the area by the construction industry;

(3) the proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination; and

(4) with respect to helpers as defined in Section IV.4(c), when such a classification prevails in the area in which the work is performed.

For implementation reference Section IV.2(c), (d) and (e).

SCHEDULE OF PRICES

NOTICE TO BIDDERS

Particular note should be made in regard to the clarity of numerals (figures) and to the procedure for alterations and the required certificate as directed by Section 1301.

The following abbreviations may be used in item description and unit of measure in the Schedule of Prices.

A	Arch	JA	Jacked
A-S	Antiseepage	LIN FT	Linear Feet
AB	Asbestos Bonded	LG	Long
ACT	Actuated	MAINT	Maintenance
AGG	Aggregate	MATL	Material
ALUM	Aluminum	MGM	1000 Board Feet
ASB	Asbestos	MET	Metal
ASPH	Asphaltic	MOD	Modification
ASSY	Assemblies	MPA	Metal Pipe Arch
B+B	Balled & Burlapped	MTD	Mounted
BC	Bituminous Coated	NON MET	Non Metallic
BIT	Bituminous	NON PERF	Non-Perforated
BLDG	Building	NON REINF	Non-Reinforced
BR	Bridge	OH	Overhead
CAL	Caliper	P-A	Pipe-Arch
CB	Catch Basin	PAVT	Pavement
CEM	Cement	PERF	Perforated
C and G	Curb and Gutter	PL	Plate
CI	Cast Iron	PNEUM	Pneumatic
C-I-P	Cast-in-Place	PREC	Precast
CL	Class	PREST	Prestressed
COMM	Commercial	PVC	Poly Vinyl Chloride
CONC	Concrete	RCPA	Reinforced Concrete Pipe Arch
COND	Conductor	REINF	Reinforced
CONN	Connection	RELO	Relocation
CONST	Construct	RESTOR	Restoration
CONT	Continuously	RMC	Rigid Metallic Conduit
CP	Cattle Pass	RNMC	Rigid Non Metallic Conduit
CTD	Coated	RDWY	Roadway
CU FT	Cubic Feet	S-G	Sand & Gravel
CU YD	Cubic Yard	SIG	Signal
CULV	Culvert	SPE	Special
CWT	Hundred Weight	SQ FT	Square Feet
DES	Design	SQ YD	Square Yard
DBL	Double	STA	Station
DI	Drop Inlet	STD	Standard
DIAM	Diameter	STL	Steel
DRWY	Driveway	STKPL	Stockpile
EXC	Excavation	STR	Strength
EXP	Expansion	STRUCT	Structural
FAB	Fabric	SPPA	Structural Plate Pipe Arch
FE	Fence	SYS	System
FERT	Fertilizer	T	Traffic
F+I	Furnish & Install	TBR	Timber
FOUND	Foundation	TEMP	Temporary
FT LG	Feet Long	THERMO	Thermoplastic
FURN	Furnish	TRTD	Treated
GA	Gauge	UNDERGRD	Underground
GRAN	Granular	UNTRTD	Untreated
HI	High	VAR	Variable
INP	In Place	VM	Vehicular Measure
INST	Install	WEAR	Wearing

INSURANCE

The contractor shall not commence work under this contract until he has obtained the following insurance, and such insurance has been approved by the Blue Earth County Attorney.

The Contractor shall deposit with the County Auditor the original, or a certified duplicate copy thereof as applicable to this project, of the Public Liability and Property Damage Insurance and Extended Coverage Policies, required hereunder. The Contractor shall furnish the County with a certificate of insurance from the insurance company issuing the policies as is herein required. All policies shall remain in force and effect on thirty days written notice to the County Auditor before cancellation. The above insurance policies shall be submitted at the same time as the contract and bond as provided in Minn. Statutes 1306.

The Contractor shall procure and maintain during the life of the Contract and until the Contract has been fully accepted, insurance policies in accordance with Minnesota Department of Transportation Standard Specifications for Construction 2005 Edition, the project Special Provisions, and as follows:

(A) PUBLIC LIABILITY AND PROPERTY DAMAGE INSURANCE: For and on behalf of himself, the County of Blue Earth as joint assureds, and with a cross- liability endorsement protection of the County of Blue Earth from claims or damages for personal injuries, including accidental death, as well as for claims for property damage which may arise by the Contractor or by a subcontractor or by anyone directly or indirectly employed by either of them.

Said Public Liability and Public Property Damage Insurance Policy shall provide that the insurance company waives the right to assert the immunity of the County as a defense to any claims made under said insurance.

The amount of such insurance will be as follows: Public Liability Insurance in an amount of not less than Two Million Dollars (\$2,000,000.00) for all damages arising out of bodily injuries to, or death of one person and subject to the same limit for each person in a total amount of not less than Two Million Dollars (\$2,000,000.00) on account of one accident, and property damage insurance in an amount not less than Two Million Dollars (\$2,000,000.00) for all damages to or destruction of property in any one accident and subject to that limit, a total limit of Two Million Dollars (\$2,000,000.00) for all damages to or destruction of property during the policy period.

(B) WORKER'S COMPENSATION INSURANCE: For all his employees employed at the site of the project and, in case any work is sublet, the Contractor shall require the subcontractor to provide Worker's Compensation Insurance for all his employees in accordance with the Minnesota Department of Transportation Standard Specifications for Construction 2005 Edition and the project Special Provisions.

(C) AUTOMOBILE PUBLIC LIABILITY INSURANCE: Two Million Dollars (\$2,000,000.00) for all damages arising out of bodily injuries to, or death of one person, and subject to that limit for each person, a total of Two Million Dollars (\$2,000,000.00) for all damages to or destruction of property in any one accident and subject to that limit, a total of Two Million Dollars (\$2,000,000.00) for all damages to or destruction of property during the policy period, if any motor vehicles are engaged in operations within the term of the contract on the site of work covering the use of all such motor vehicles unless such coverage is included in the insurance provided for under subsection "A" hereof.

(1714) RESPONSIBILITY FOR DAMAGE CLAIMS

The first paragraph of 1714 is revised to read as follows:

The Contractor shall indemnify and save harmless the State of Minnesota, the County of Blue Earth, their officers and employees from all suits, actions, and claims of any character brought because of injuries or damages received or sustained by any person, persons, or property on account of the operations of the said Contractor; or on account of or in consequence of any neglect in safeguarding the work; or through use of unacceptable materials in constructing the work; or because of any act or omission, neglect, or misconduct of said Contractor; or because of any claims arising or amounts recovered from infringements of patent, trademark, or copyright; or because of any claims arising or amounts recovered under the Worker's Compensation Act; or under any other law, ordinance, order or decree.

PROOF OF WORKER'S COMPENSATION INSURANCE COVERAGE

Minnesota Statute Section 176.182 requires every state and local licensing agency to withhold the issuance or renewal of a license or permit to operate a business in Minnesota until the applicant presents acceptable evidence of compliance with the workers' compensation insurance coverage requirement of Section 176.181, Subd. 2. The information required is: The name of the insurance company, the policy number, and dates of coverage or the permit to self-insure. This information will be collected by the licensing agency and put in their company file. It will be furnished, upon request, to the Department of Labor and Industry to check for compliance with Minnesota Statute Sec. 176.181, Subd. 2.

This information is required by law, and licenses and permits to operate a business may not be issued or renewed if it is not provided and/or is falsely reported. Furthermore, if this information is not provided and/or falsely reported, it may result in a \$1,000 penalty assessed against the applicant by the Commissioner of the Department of Labor and Industry payable to the Special Compensation Fund.

Provide the information specified above in the spaces provided, or certify the precise reason your business is excluded from compliance with the insurance coverage requirement for workers' compensation.

Insurance Company Name _____
(NOT the insurance agent)

Policy Number or Self-insurance Permit Number: _____

Dates of Coverage: _____

(or)

I am not required to have worker's compensation liability coverage because:

() I have no employees covered by the law.

() Other (Specify) _____

I HAVE READ AND UNDERSTAND MY RIGHTS AND OBLIGATIONS WITH REGARDS TO BUSINESS LICENSES, PERMITS, AND WORKER'S COMPENSATION COVERAGE, AND I CERTIFY THAT THE INFORMATION PROVIDED IS TRUE AND CORRECT.

(SIGNATURE)

NOTICE TO BIDDERS

This project has a Disadvantaged Business Enterprise (DBE) requirement.

If you are the apparent low bidder, you will be required to submit certain DBE documents to the Office of Civil Rights at the Minnesota Department of Transportation **within five (5) business days after the bid opening date** (the five day period starts the next business day after the bid opening date). Failure to do so could result in **disqualification** as the lowest responsible bidder and award proceedings may then be initiated with the next lowest responsible bidder.

The local agency will attempt to notify the apparent low bidder as soon as possible after the bids are opened and examined. To ensure that the apparent low bidder is notified in a timely manner it is required to have the contact information for at least one responsible party and an alternate party – at least one of whom must be available immediately after the bids have been examined – capable of commencing the DBE document submittal.

Fill in the contact information in the spaces provided.

Responsible party:

Name: _____

Telephone: _____

Fax: _____

Email address: _____

Postal address: _____

Alternate party:

Name: _____

Telephone: _____

Fax: _____

Email address: _____

Postal address: _____

THE FOLLOWING CERTIFICATION WITH REGARD TO THE PERFORMANCE OF PREVIOUS CONTRACTS OR SUBCONTRACTS SUBJECT TO THE EQUAL OPPORTUNITY CLAUSE AND THE FILING OF REQUIRED REPORTS SHALL BE EXECUTED BY THE BIDDER.

The bidder hereby certifies the he/she has _____, has not _____, participated in a previous contract or subcontract subject to the equal opportunity clause, as required by Executive Orders 10925, 11114 or 11246, and that he/she has _____, has not _____, filed with the Joint Reporting Committee, the Director of the Office of Federal Contract Compliance, a Federal Government contracting or administering agency, or the former President's Committee on Equal Employment Opportunity, all reports due under the applicable filing requirements.

(Company)

By: _____

(Title)

Date: _____

Note: The above certification is required by the Equal Employment Opportunity Regulations of the Secretary of Labor (41CFR 60-1.7(b)(1)), and must be submitted by bidders and proposed subcontractors only in connection with contracts and subcontracts which are exempt from the equal opportunity clause. Contracts and subcontracts which are exempt from the equal opportunity clause are set forth in 41 CFR 60-1.5. (Generally only contracts or subcontracts of \$10,000 or under are exempt.)

Currently, Standard Form 100 (EEO-1) is the only report required by Executive Orders or their implementing regulations.

Proposed prime contractors and subcontractors who have participated in a previous contract or subcontract subject to the Executive Orders and have not filed the required reports should note that 41 CFR 60-1.7(b)(1) prevents the award of contracts and subcontracts unless such contractor submits a report covering the delinquent period or such other period specified by the Federal Highway Administration or by the Director, Office of Federal Contract Compliance, U.S. Department of Labor.

NON-COLLUSION AFFIDAVIT

The following Non-Collusion Affidavit shall be executed by the bidder:

State Project No. _____

Federal Project No. _____

State of Minnesota _____)
) ss

County of _____)

I, _____, do state under penalty of
(name of person signing this affidavit)

perjury under 28 U.S.C. 1746 of the laws of the United States:

(1) that I am the authorized representative of _____

(name of person, partnership or corporation submitting this proposal)

and that I have the authority to make this affidavit for and on behalf of said bidder;

(2) that, in connection with this proposal, the said bidder has not either directly or indirectly entered into any agreement, participated in any collusion or otherwise taken any action in restraint of free competitive bidding;

(3) that, to the best of my knowledge and belief, the contents of this proposal have not been communicated by the bidder or by any of his/her employees or agents to any person who is not an employee or agent of the bidder or of the surety on any bond furnished with the proposal and will not be communicated to any person who is not an employee or agent of the bidder or of said surety prior to the official opening of the proposal, and

(4) that I have fully informed myself regarding the accuracy of the statements made in this affidavit.

Signed: _____
(bidder or his authorized representative)

4/24/2012

Contract No.: 12716

Blue Earth
Schedule Of Prices By Category By Contract Projects

Project Number: SP 007-612-011

Project Title or Road Number: Contract No.: 12716 - SP 007-612-011 - CSAH 12 (Stage 4)

Work Type: SP 007-612-011 - Grading, Drainage and Concrete Pavement

BIDDER MUST FILL IN UNIT PRICES IN NUMERALS; MAKE EXTENSION FOR EACH ITEM AND TOTAL. FOR COMPLETE INFORMATION CONCERNING THESE ITEMS, SEE PLANS AND SPECIFICATIONS, INCLUDING SPECIAL PROVISIONS.					
Item No.	Description	Units	Quantity	Unit Price	Total Price
Project SP 007-612-011					
BRIDGE					
2301.531	EXPANSION JOINTS DESIGN E8H (P)	LIN FT	158.00		
2301.553	BRIDGE APPROACH PANELS (P)	SQ YD	351.00		
2401.501	STRUCTURAL CONCRETE (1A43) (P)	CU YD	305.00		
2401.501	STRUCTURAL CONCRETE (3Y43) (P)	CU YD	365.00		
2401.512	BRIDGE SLAB CONCRETE (3Y36A) (P)	SQ FT	18,578.00		
2401.513	TYPE F (TL-4) RAILING CONCRETE (3Y46A) (P)	LIN FT	276.00		
2401.513	TYPE MOD P-1 (TL-2) RAILING CONCRETE (3Y46A) (P)	LIN FT	276.00		
2401.515	SIDEWALK CONCRETE (3Y46A) (P)	SQ FT	3,308.00		
2401.516	RAISED MEDIAN CONCRETE (3Y46A) (P)	SQ FT	1,103.00		
2401.541	REINFORCEMENT BARS (P)	POUND	24,230.00		
2401.541	REINFORCEMENT BARS (EPOXY COATED) (P)	POUND	191,220.00		
2401.601	STRUCTURE EXCAVATION	LUMP SUM	1.00		
2402.583	ORNAMENTAL METAL RAILING TYPE SPECIAL (P)	LIN FT	270.00		
2402.595	BEARING ASSEMBLY	EACH	36.00		
2404.501	CONCRETE WEARING COURSE (3U17A) (P)	SQ FT	16,540.00		
2404.618	BLASTING (SPECIAL)	SQ FT	16,540.00		
2405.502	PRESTRESSED CONCRETE BEAMS MN54 (P)	LIN FT	2,098.00		
2405.511	DIAPHRAGMS FOR TYPE MN54 PREST BEAMS (P)	LIN FT	448.00		
2411.618	ARCHITECTURAL SURFACE FINISH (SINGLE COLOR) (P)	SQ FT	1,157.00		
2411.618	ARCHITECTURAL CONCRETE TEXTURE (FRACTURED FIN) (P)	SQ FT	1,157.00		

BIDDER MUST FILL IN UNIT PRICES IN NUMERALS; MAKE EXTENSION FOR EACH ITEM AND TOTAL. FOR COMPLETE INFORMATION CONCERNING THESE ITEMS, SEE PLANS AND SPECIFICATIONS, INCLUDING SPECIAL PROVISIONS.					
Item No.	Description	Units	Quantity	Unit Price	Total Price
2452.507	C-I-P CONCRETE PILING DELIVERED 12"	LIN FT	15,140.00		
2452.508	C-I-P CONCRETE PILING DRIVEN 12"	LIN FT	15,140.00		
2452.519	C-I-P CONCRETE TEST PILE 125 FT LONG 12"	EACH	2.00		
2452.519	C-I-P CONCRETE TEST PILE 135 FT LONG 12"	EACH	4.00		
2452.527	PILE REDRIVING	EACH	34.00		
2452.602	PILE ANALYSIS	EACH	6.00		
2452.603	BITUMEN PILE COATING	LIN FT	6,160.00		
2502.502	DRAINAGE SYSTEM TYPE (B910)	LUMP SUM	1.00		
2514.501	CONCRETE SLOPE PAVING (P)	SQ YD	422.00		
2545.509	CONDUIT SYSTEM, BRIDGE (FUTURE)	LUMP SUM	1.00		
2545.509	CONDUIT SYSTEM, BRIDGE (LIGHTING)	LUMP SUM	1.00		
2564.522	STRUCTURAL STEEL-TRUSSES FOR OH SIGNS BRIDGE MOUNTED (P)	POUND	1,060.00		
Total BRIDGE					
ROADWAY/INTERCHANGE					
2021.501	MOBILIZATION	LUMP SUM	1.00		
2102.502	PAVEMENT MARKING REMOVAL	LIN FT	300.00		
2104.501	REMOVE PIPE CULVERTS	LIN FT	166.00		
2104.505	REMOVE CONCRETE PAVEMENT	SQ YD	1,384.00		
2104.505	REMOVE BITUMINOUS PAVEMENT	SQ YD	4,579.00		
2104.509	REMOVE CONCRETE APRON	EACH	1.00		
2104.509	REMOVE METAL APRON	EACH	2.00		
2104.509	REMOVE SIGN TYPE A	EACH	4.00		
2104.509	REMOVE SIGN TYPE C	EACH	5.00		
2104.509	REMOVE SIGN TYPE D	EACH	1.00		

BIDDER MUST FILL IN UNIT PRICES IN NUMERALS; MAKE EXTENSION FOR EACH ITEM AND TOTAL. FOR COMPLETE INFORMATION CONCERNING THESE ITEMS, SEE PLANS AND SPECIFICATIONS, INCLUDING SPECIAL PROVISIONS.					
Item No.	Description	Units	Quantity	Unit Price	Total Price
2104.511	SAWING CONCRETE PAVEMENT (FULL DEPTH)	LIN FT	4,312.00		
2104.513	SAWING BITUMINOUS PAVEMENT (FULL DEPTH)	LIN FT	1,311.00		
2104.523	SALVAGE CONCRETE APRON	EACH	1.00		
2104.523	SALVAGE SIGN PANEL TYPE A	EACH	1.00		
2105.501	COMMON EXCAVATION (P)	CU YD	129,789.00		
2105.507	SUBGRADE EXCAVATION (P)	CU YD	587.00		
2105.522	SELECT GRANULAR BORROW (CV)	CU YD	9,974.00		
2105.522	SELECT GRANULAR BORROW MOD 10% (CV)	CU YD	1,112.00		
2105.523	COMMON BORROW (CV) (P)	CU YD	845.00		
2112.619	AGGREGATE BASE PREPARATION (STRINGLINE)	ROAD STA	112.39		
2123.610	DOZER (D6 OR APPROVED EQUIPMENT)	HOUR	8.00		
2123.610	TRACTOR MOUNTED BACKHOE	HOUR	6.00		
2211.501	AGGREGATE BASE CLASS 3	TON	42,238.00		
2211.501	AGGREGATE BASE CLASS 5	TON	45,765.00		
2221.501	AGGREGATE SHOULDERING CLASS 2	TON	730.00		
2301.511	STRUCTURAL CONCRETE	CU YD	3,283.00		
2301.538	DOWEL BAR	EACH	7,118.00		
2301.602	DRILL & GROUT DOWEL BAR (EPOXY COATED)	EACH	1,560.00		
2301.604	CONCRETE PAVEMENT 9.0"	SQ YD	13,124.00		
2301.608	REINFORCEMENT BARS (EPOXY COATED)	POUND	11,788.00		
2357.502	BITUMINOUS MATERIAL FOR TACK COAT	GALLON	4,339.00		
2360.501	TYPE SP 12.5 WEARING COURSE MIXTURE (2,B)	TON	1,284.00		

BIDDER MUST FILL IN UNIT PRICES IN NUMERALS; MAKE EXTENSION FOR EACH ITEM AND TOTAL. FOR COMPLETE INFORMATION CONCERNING THESE ITEMS, SEE PLANS AND SPECIFICATIONS, INCLUDING SPECIAL PROVISIONS.					
Item No.	Description	Units	Quantity	Unit Price	Total Price
2360.501	TYPE SP 12.5 WEARING COURSE MIXTURE (4,C)	TON	10,145.00		
2360.502	TYPE SP 12.5 NON WEARING COURSE MIXTURE (4,C)	TON	6,310.00		
2501.573	INSTALL CONCRETE APRON	EACH	1.00		
2502.501	4" PRECAST CONCRETE HEADWALL	EACH	33.00		
2502.521	4" TP PIPE DRAIN	LIN FT	1,416.00		
2502.541	6" PERF PVC PIPE DRAIN (SDR35)	LIN FT	2,289.00		
2502.541	4" PERF PE PIPE DRAIN	LIN FT	32,145.00		
2511.501	RANDOM RIPRAP CLASS III	CU YD	40.00		
2511.511	GRANULAR FILTER	CU YD	12.00		
2521.501	4" CONCRETE WALK	SQ FT	5,237.00		
2521.501	6" CONCRETE WALK	SQ FT	997.00		
2531.501	CONCRETE CURB & GUTTER DESIGN B424	LIN FT	7,972.00		
2531.501	CONCRETE CURB & GUTTER DESIGN B624	LIN FT	6,880.00		
2531.501	CONCRETE CURB & GUTTER DESIGN D424	LIN FT	989.00		
2531.501	CONCRETE CURB & GUTTER DESIGN S524	LIN FT	854.00		
2531.502	CONCRETE CURB DESIGN B6	LIN FT	694.00		
2531.502	CONCRETE CURB DESIGN B8	LIN FT	634.00		
2531.503	4" CONCRETE MEDIAN	SQ YD	3,293.00		
2531.507	8" CONCRETE DRIVEWAY PAVEMENT	SQ YD	1,038.00		
2531.618	TRUNCATED DOMES	SQ FT	256.00		
2533.507	PORTABLE PRECAST CONCRETE BARRIER DESIGN 8337	LIN FT	5,297.00		
2533.507	RELOCATE PORTABLE PRECAST CONCRETE BARRIER DESIGN 8337	LIN FT	2,246.00		

BIDDER MUST FILL IN UNIT PRICES IN NUMERALS; MAKE EXTENSION FOR EACH ITEM AND TOTAL. FOR COMPLETE INFORMATION CONCERNING THESE ITEMS, SEE PLANS AND SPECIFICATIONS, INCLUDING SPECIAL PROVISIONS.					
Item No.	Description	Units	Quantity	Unit Price	Total Price
2545.501	ELECTRIC LIGHT SYSTEM	LUMP SUM	1.00		
2554.501	TRAFFIC BARRIER DESIGN SPECIAL	LIN FT	50.00		
2554.501	TRAFFIC BARRIER DESIGN B8338	LIN FT	850.00		
2554.521	ANCHORAGE ASSEMBLY-PLATE BEAM	EACH	2.00		
2554.523	END TREATMENT-TANGENT TERMINAL	EACH	4.00		
2554.602	IMPACT ATTENUATOR BARRELS	EACH	76.00		
2554.602	RELOCATE IMPACT ATTENUATOR BARRELS	EACH	94.00		
2557.501	WIRE FENCE DESIGN 60-9322	LIN FT	5,097.00		
2557.521	WOOD BRACE ASSEMBLY	EACH	48.00		
2563.601	TRAFFIC CONTROL	LUMP SUM	1.00		
2563.602	RAISED PAVEMENT MARKER TEMPORARY	EACH	368.00		
2563.602	PORTABLE CONCRETE BARRIER DELINEATOR	EACH	229.00		
2564.522	STRUCTURAL STEEL-POSTS FOR TYPE A SIGNS	POUND	6,433.50		
2564.531	SIGN PANELS TYPE A	SQ FT	747.50		
2564.531	SIGN PANELS OVERLAY TYPE A	SQ FT	44.00		
2564.531	SIGN PANELS TYPE C	SQ FT	955.675		
2564.531	SIGN PANELS TYPE D	SQ FT	101.50		
2564.531	SIGN PANELS TYPE OVERLAY	SQ FT	36.00		
2564.537	INSTALL SIGN TYPE OH (BR MOUNT)	EACH	1.00		
2564.550	DELINEATOR TYPE X4-6	EACH	16.00		
2564.551	REFERENCE POST MARKER	EACH	1.00		
2564.552	HAZARD MARKER X4-2	EACH	4.00		

BIDDER MUST FILL IN UNIT PRICES IN NUMERALS; MAKE EXTENSION FOR EACH ITEM AND TOTAL. FOR COMPLETE INFORMATION CONCERNING THESE ITEMS, SEE PLANS AND SPECIFICATIONS, INCLUDING SPECIAL PROVISIONS.					
Item No.	Description	Units	Quantity	Unit Price	Total Price
2571.505	DECIDUOUS SHRUB NO 2 CONT	SHRUB	486.00		
2571.505	DECIDUOUS SHRUB NO 10 CONT	SHRUB	14.00		
2571.507	PERENNIAL NO 1 CONT	PLANT	1,292.00		
2573.502	SILT FENCE, TYPE MACHINE SLICED	LIN FT	19,291.00		
2573.512	TEMPORARY DITCH CHECK TYPE 2	LIN FT	2,370.00		
2573.513	TEMPORARY DITCH CHECK TYPE 7	CU YD	375.00		
2573.520	SEDIMENT REMOVAL BACKHOE	HOUR	12.00		
2573.530	STORM DRAIN INLET PROTECTION	EACH	52.00		
2573.540	FILTER LOG TYPE WOOD FIBER BIOROLL	LIN FT	2,420.00		
2573.550	EROSION CONTROL SUPERVISOR	LUMP SUM	1.00		
2575.501	SEEDING	ACRE	50.7941		
2575.502	SEED MIXTURE 150	POUND	1,008.00		
2575.502	SEED MIXTURE 270	POUND	265.00		
2575.502	SEED MIXTURE 280	POUND	1,170.00		
2575.511	MULCH MATERIAL TYPE 1	TON	91.46		
2575.519	DISK ANCHORING	ACRE	45.743		
2575.523	EROSION CONTROL BLANKETS CATEGORY 4	SQ YD	19,030.00		
2575.525	EROSION STABILIZATION MAT CLASS 4	SQ YD	700.00		
2575.532	COMMERCIAL FERTILIZER ANALYSIS 20-10-20	POUND	8,956.00		
2575.560	HYDRAULIC SOIL STABILIZER TYPE 5	POUND	52,923.00		
2575.607	MULCH MATERIAL TYPE SPECIAL	CU YD	146.00		
2581.501	REMOVABLE PREFORMED PLASTIC MARKING	LIN FT	12,322.00		

BIDDER MUST FILL IN UNIT PRICES IN NUMERALS; MAKE EXTENSION FOR EACH ITEM AND TOTAL. FOR COMPLETE INFORMATION CONCERNING THESE ITEMS, SEE PLANS AND SPECIFICATIONS, INCLUDING SPECIAL PROVISIONS.					
Item No.	Description	Units	Quantity	Unit Price	Total Price
2581.603	REMOVABLE PREFORMED PLASTIC MASK (BLACK)	LIN FT	3,426.00		
2582.501	PAVEMENT MESSAGE (LEFT ARROW) POLY PREFORM	EACH	6.00		
2582.501	PAVEMENT MESSAGE (LEFT FISH HOOK ARROW WITH DOT) POLY PREFORM	EACH	2.00		
2582.501	PAVEMENT MESSAGE (RIGHT ARROW) POLY PREFORM	EACH	11.00		
2582.501	PAVEMENT MESSAGE (THRU ARROW) POLY PREFORM	EACH	2.00		
2582.501	PAVEMENT MESSAGE (THRU FISH-HOOK ARROW) POLY PREFORM	EACH	5.00		
2582.501	PAVEMENT MESSAGE (THRU FISH-HOOK ARROW WITH DOT) POLY PREFORM	EACH	2.00		
2582.501	PAVEMENT MESSAGE (LT-THRU FISH-HOOK ARROW WITH DOT) POLY PREFORM	EACH	4.00		
2582.501	PAVEMENT MESSAGE (LEFT-THRU ARROW) POLY PREFORM	EACH	2.00		
2582.502	8" DOTTED LINE WHITE-PAINT	LIN FT	30.00		
2582.502	8" SOLID LINE WHITE-POLY PREFORM (GROUND IN)	LIN FT	800.00		
2582.502	8" DOTTED LINE WHITE-POLY PREFORM (GROUND IN)	LIN FT	200.00		
2582.502	4" SOLID LINE WHITE-EPOXY	LIN FT	29,600.00		
2582.502	24" SOLID LINE WHITE-EPOXY	LIN FT	295.00		
2582.502	4" BROKEN LINE WHITE-EPOXY	LIN FT	2,020.00		
2582.502	4" DOTTED LINE WHITE-EPOXY	LIN FT	45.00		
2582.502	18" DOTTED LINE WHITE-EPOXY	LIN FT	120.00		
2582.502	4" SOLID LINE YELLOW-EPOXY	LIN FT	6,300.00		
2582.502	24" SOLID LINE YELLOW-EPOXY	LIN FT	35.00		
2582.502	4" BROKEN LINE YELLOW-EPOXY	LIN FT	260.00		
Total ROADWAY/INTERCHANGE					
STORM SEWER					
2501.511	18" RC PIPE CULVERT CLASS IV	LIN FT	312.00		
2501.511	24" RC PIPE CULVERT CLASS IV	LIN FT	282.00		

BIDDER MUST FILL IN UNIT PRICES IN NUMERALS; MAKE EXTENSION FOR EACH ITEM AND TOTAL. FOR COMPLETE INFORMATION CONCERNING THESE ITEMS, SEE PLANS AND SPECIFICATIONS, INCLUDING SPECIAL PROVISIONS.					
Item No.	Description	Units	Quantity	Unit Price	Total Price
2501.511	42" RC PIPE CULVERT CLASS IV	LIN FT	12.00		
2501.515	12" RC PIPE APRON	EACH	15.00		
2501.515	15" RC PIPE APRON	EACH	1.00		
2501.515	18" RC PIPE APRON	EACH	10.00		
2501.515	24" RC PIPE APRON	EACH	3.00		
2501.521	28" SPAN RC PIPE-ARCH CULVERT CLASS IIA	LIN FT	168.00		
2501.525	28" SPAN RC PIPE-ARCH APRON	EACH	2.00		
2503.541	12" RC PIPE SEWER DESIGN 3006 CLASS V	LIN FT	2,254.00		
2503.541	15" RC PIPE SEWER DESIGN 3006 CLASS V	LIN FT	50.00		
2503.541	18" RC PIPE SEWER DESIGN 3006 CLASS IV	LIN FT	571.00		
2503.541	30" RC PIPE SEWER DESIGN 3006 CLASS IV	LIN FT	57.00		
2503.602	CONNECT TO EXISTING STORM SEWER	EACH	1.00		
2506.501	CONSTRUCT DRAINAGE STRUCTURE DESIGN H	LIN FT	21.00		
2506.501	CONSTRUCT DRAINAGE STRUCTURE DESIGN N	LIN FT	2.54		
2506.501	CONSTRUCT DRAINAGE STRUCTURE DESIGN SPECIAL R-1	LIN FT	99.45		
2506.501	CONSTRUCT DRAINAGE STRUCTURE DESIGN 48-4020	LIN FT	34.26		
2506.501	CONSTRUCT DRAINAGE STRUCTURE DESIGN 60-4020	LIN FT	7.28		
2506.501	CONSTRUCT DRAINAGE STRUCTURE DESIGN 48-4022	LIN FT	91.04		
2506.501	CONSTRUCT DRAINAGE STRUCTURE DESIGN 60-4022	LIN FT	8.38		
2506.516	CASTING ASSEMBLY	EACH	49.00		
Total STORM SEWER					
SP 007-612-011 Project Total					
Grand Total					

Bidder Name: _____

Bidder Address: _____

Bidder Phone: _____

Bidder Signature: _____

Date: _____

State Project No. 007-612-011

GRAND TOTAL \$ _____

PROPOSAL GUARANTY required by 1208 of the Specifications: "A (certified check) (bond), prepared as required by 1208 of the Specifications and payable to the Blue Earth County Treasurer, in an amount equal to at least 5% of the total amount of the bid is submitted herewith as a proposal guaranty.

DISADVANTAGED BUSINESS ENTERPRISE CERTIFICATION: Our firm will meet a minimum goal of ____% of this contract to Disadvantaged Business Enterprises. A bidder who fails to indicate a specific goal above must fulfill the total goals indicated in the proposal.

NON-COLLUSION AFFIDAVIT: A Non-Collusion Affidavit is found in this proposal which must be signed by each bidder.

RECEIPT OF ADDENDA as required by 1210 of the Specifications:

The undersigned hereby acknowledges receipt of and has considered:

Addendum No. ____ Dated _____ Addendum No. ____ Dated _____

Addendum No. ____ Dated _____ Addendum No. ____ Dated _____

Signed

EXECUTION OF PROPOSAL as required by 1206 of the Specifications:

This proposal dated the ____ day of _____, 20____

Signed: _____, P.O. Address _____ as an individual.

Signed: _____, P.O. Address _____ as an individual.

doing business under the name and style of

Signed: _____, for _____ a partnership.

NAME

BUSINESS ADDRESS

Signed: _____, for _____ a corporation,
incorporated under the laws of the State of Minnesota

Name of President _____ Business Address _____

Name of Vice-President _____ Business Address _____

Name of Secretary _____ Business Address _____

Name of Treasurer _____ Business Address _____

(NOTE: Signatures shall comply with 1206 of the Specifications.)

